Vol. 987 Number 2

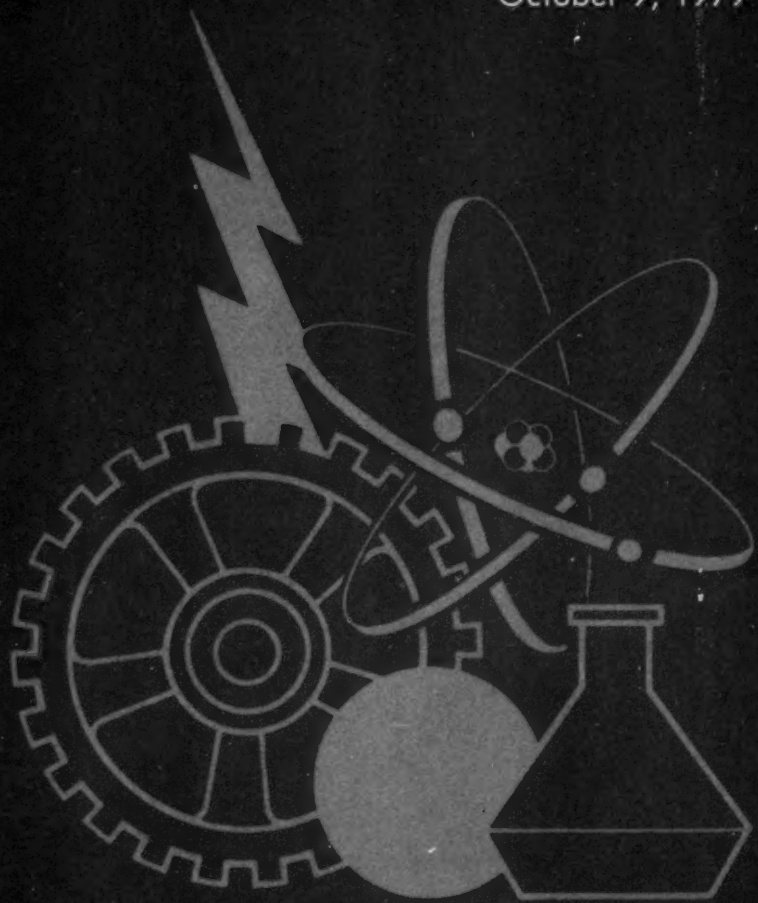
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 9, 1979



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

October 9, 1979 Volume 987 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(1) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(11)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before November 2, 1979.

Sept. 12, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Bremer, Thomas R., 25 Merritt Ave., Massapequa, N.Y. 11758
Collett, Glenn, 2432 Lower Bluff Rd., Emmett, Idaho 93617
Cooper, Kenneth J., 21900 Mauer, St. Clair Shores, Mich. 48080
Cunningham, Francis V., 5316 Central Ave., Western Springs, Ill. 60558
Eckel, James R., 5104 Copperfield Lane, Culver City, Calif. 90230
Lentz, Joseph R., 4 E. Branch Lane, Baltimore, Md. 21202
Levy, Donald, 4277 Labyrinth Rd., Baltimore, Md. 21215
Palo, Ralph R., 63 Cleveland Ave., South River, N.J. 08882
Pratt, John S., 14 Exeter Rd., Avondale Estates, Ga. 30002
Schow, Horace II, 2816 Roscommon Dr., Tallahassee, Fla. 32308
Unterberg, Walter, 1454 S. Saltair Ave., Los Angeles, Calif. 90025
Welch, Lawrence T., 1217 Franklin, Kalamazoo, Mich. 49001
Wilson, Craig, Canadian G. E. Co., Ltd., 1420 Dupont St., Toronto, Ontario, Canada M6H2B2
Zambo, Richard A., 31 S. Curtisville Rd., Concord, N.H. 03301

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,928,553, Re. S.N. 020,626, Filed Mar. 15, 1979, Cl. 424/1, RADIOIMMUNOASSAY METHOD FOR TRIIODOTHYRONINE AND THYROXINE, Charles S. Hollander, Owner of Record: *New York University, New York, N.Y.,* Attorney or Agent: I. Morley Drucker, Ex. Gp.: 223

4,050,545, Re. S.N. 054,226, Filed Jul. 2, 1979, Cl. 187/8.43, VEHICLE LIFTING JACK ASSEMBLY, Lee Hunter, Owner of Record: *Inventor,* Attorney or Agent: Frederick M. Woodruff, et al., Ex. Gp.: 311

4,084,539, Re. S.N. 042,854, Filed May 29, 1979, Cl. 118/685, VOLTAGE TO AIR PRESSURE TRANSDUCER, Robert W. Schmidt, Owner of Record: *Copar Corporation, Oak Lawn, Ill.,* Attorney or Agent: James B. Kinzer, et al., Ex. Gp.: 166

4,091,996, Re. S.N. 052,212, Filed Jun. 26, 1979, Cl. 239/177, SPRINKLER IRRIGATION SYSTEM AND APPARATUS FOR DIRECTING A STREAM OF WATER INTO THE ATMOSPHERE, Nelson R. Barton, Owner of Record: *Nelson Irrigation Corporation, Walla Walla, Wash.,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 213

4,113,687, Re. S.N. 053,202, Filed Jun. 29, 1979, Cl. 260/29.6 XA, PROCESS FOR PREPARING LATEX, John Ugelstad, Owner of Record: *Sintef, Trondheim, Norway,* Attorney or Agent: John E. Lind, et al., Ex. Gp.: 141

4,136,251, Re. S.N. 051,974, Filed Jun. 25, 1979, Cl. 528/251, EXTRUSION PROCESS FOR RECOVERY OF POLYMERS FROM THEIR DISPERSIONS IN LIQUIDS, Archie Robert Bice, et al., Owner of Record: *E. I. Du Pont de Nemours and Company, Wilmington, Del.,* Attorney or Agent: Paul R. Steyermark, Ex. Gp.: 144

PATENT NOTICES

Certificates of Correction for the Week of Oct. 9, 1979

Re. 29,846	4,136,687	4,152,151	4,158,584
Re. 29,941	4,137,127	4,153,349	4,158,597
3,833,790	4,137,330	4,153,681	4,158,751
3,975,932	4,137,710	4,153,766	4,158,784
3,997,142	4,138,313	4,153,958	4,158,927
4,022,498	4,139,600	4,153,986	4,159,165
4,023,477	4,140,182	4,154,169	4,159,230
4,047,479	4,140,213	4,154,335	4,159,277
4,052,537	4,141,126	4,154,646	4,159,345
4,059,485	4,141,496	4,155,012	4,159,358
4,061,779	4,142,388	4,155,120	4,159,612
4,080,225	4,143,075	4,155,514	4,159,662
4,080,432	4,143,599	4,155,618	4,159,766
4,080,636	4,143,633	4,155,747	4,159,842
4,087,335	4,144,122	4,155,997	4,159,885
4,088,914	4,144,569	4,156,223	4,159,897
4,091,124	4,145,102	4,156,252	4,159,904
4,093,114	4,145,955	4,156,421	4,159,956
4,093,885	4,146,264	4,156,659	4,160,027
4,093,888	4,147,075	4,156,696	4,160,064
4,094,634	4,147,140	4,156,726	4,160,066
4,094,860	4,147,338	4,156,727	4,160,158
4,101,523	4,147,646	4,156,791	4,160,191
4,105,323	4,147,739	4,156,892	4,160,192
4,108,638	4,147,834	4,156,940	4,160,260
4,109,383	4,147,960	4,157,041	4,160,290
4,109,934	4,148,212	4,157,052	4,160,355
4,117,166	4,148,251	4,157,148	4,160,364
4,117,958	4,148,674	4,157,346	4,160,399
4,120,079	4,148,799	4,157,379	4,160,540
4,122,168	4,148,969	4,157,387	4,160,599
4,124,855	4,149,076	4,157,748	4,160,772
4,125,458	4,149,143	4,157,878	4,160,773
4,126,183	4,149,401	4,157,914	4,160,808
4,126,559	4,149,476	4,158,032	4,160,919
4,127,213	4,150,449	4,158,165	4,161,158
4,128,342	4,150,765	4,158,241	4,161,244
4,131,149	4,151,288	4,158,242	4,161,400
4,133,059	4,151,408	4,158,265	4,161,422
4,133,262	4,151,584	4,158,312	4,161,578
4,135,536	4,152,133	4,158,398	4,161,737
4,136,129			

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division, Room 2D 444, Pentagon
Washington, D.C. 20310

Patent 4,116,477. Connector, Reducer/Adapter, Flare to Flareless. Filed Jan. 14, 1977. Patented Sept. 26, 1978. Not available NTIS.

Patent 3,852,502. The Method of Stabilizing Foods With an Antioxidant. Filed Apr. 9, 1973. Patented Dec. 3, 1974. Not available NTIS.

Patent 3,873,725. Insect Repellent Composition Containing C6–C8 Alkyl Monoethers of Triethylene Glycol. Filed Jan. 29, 1973. Patented Mar. 25, 1975. Not available NTIS.

Patent 4,104,414. Process of Making Dehydrated Fruit Juice. Filed June 21, 1974. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,107,335. Freeze-Dried Mix for Spoonable Salad Dressing and Method Therefor. Filed Apr. 8, 1977. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,109,020. Method of Producing Crisp Reheated French Fried Potatoes. Filed July 1, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,109,026. Process for Producing Compacted, Dehydrated, Uncooked Cabbage and Cabbage Product Thereof. Filed July 25, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,109,455. Spiral Orifice Dashpot Timer. Filed May 26, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,110,730. Rate Sensitive System for a Seismic Sensing Range Containment Apparatus. Filed June 23, 1977. Patented Aug. 29, 1978. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch, General Service Division, Federal Bldg., Agricultural Research Service
Hyattsville, Md. 20782

Patent application 6–000,739. Cephalomannie and Its Use in Treating Leukemic Tumors. Filed Jan. 3, 1979.

Patent application 6–015,491. Protected Feeds for Ruminants. Filed Feb. 26, 1979.

Patent application 6–015,503. Apparatus and Method for Treatment of Fibers With Ozone-Steam Mixtures. Filed Feb. 23, 1979.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 6–012,222. Balloon Catheter and Technique for the Manufacture Thereof. Filed Feb. 14, 1979.

Patent application 6–014,552. Radioreceptor Assay for Benzodiazepines in Salvia. Filed Feb. 23, 1979.

Patent application 963,784. Radioimmunoassay for Chlorinated Dibenzo-P-Dioxins. Filed Nov. 27, 1978.

Patent application 964,654. Immunoassay Utilizing 1251 Protein A. Filed Nov. 29, 1978.

Patent 4,140,761. Modification of Hepatitis B Virus Infection in Chronic Carriers of Hepatitis B Surface Antigen. Filed Apr. 11, 1977. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,140,851. Synthesis and Antitumor Activity of 2,4,5-Trisubstituted-Pyrrolo(2,3-d)-Pyrimidine Nucleosides. Filed Nov. 21, 1977. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,148,585. Three Dimensional Laser Doppler Velocimeter. Filed Feb. 11, 1977. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,148,888. 3-Deazaadenosine as an Inhibitor of Adenosylhomocysteine Hydrolase With Antiviral Activity. Filed Mar. 13, 1978. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,151,089. Device for High Efficiency Continuous Countercurrent Extraction Using a Rotating Helical Tube. Filed May 17, 1978. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,143,426. Permanently Attached Artfiicial Limb. Filed Mar. 30, 1977. Patented Mar. 13, 1979. Not available NTIS.

Patent application 909,458. Process for Separating Blood Cell-Containing Liquid Suspensions by Filtration. Filed May 25, 1978.

Patent application 909,459. Filtration Apparatus for Separating Blood Cell-Containing Liquid Suspensions. Filed May 25, 1978.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 6–015,995. Pitch Attitude Stabilization System Utilizing Engine Pressure Ratio Feedback Signals. Filed Feb. 28, 1979.

Patent application 6–015,996. Velocity Vector Control System Augmented With Direct Lift Control. Filed Feb. 28, 1979.

Patent application 6–023,439. Terminal Guidance Sensor System. Filed Mar. 23, 1979.

Patent application 6–023,484. Controller for Computer Control of Brushless DC Motors. Filed Mar. 23, 1979.

Patent application 6–025,162. Low Cost Cryostat. Filed Mar. 29, 1979.

Patent application 6–027,559. An Improved Solar Energy Receiver for a Stirling Engine. Filed Apr. 6, 1979.

Patent application 827,464. Multi-Channel Rotating Optical Interface for Data Transmission. Filed Aug. 25, 1977.

Patent application 830,562. System for Detecting Substructure Microfractures and Method Therefor. Filed Sept. 6, 1977.

Patent application. 830,846. System for Plotting Subsoil Structure and Method Therefor. Filed Sept. 6, 1977.

Patent 4,139,291. System and Method for Obtaining Wide Screen Schlieren Photographs. Filed Feb. 9, 1978. Patented Feb. 13, 1979. Not available NTIS.

Patent 4,139,806. Acoustic Driving of Rotor. Filed July 5, 1977. Patented Feb. 13, 1979. Not available NTIS.

Patent 4,139,839. Digital Data Reformatter/Deserializer. Filed Mar. 18, 1977. Patented Feb. 13, 1979. Not available NTIS.

Patent 4,139,862. Interactive Color Display for Multispectral Imagery Using Correlation Clustering. Filed Sept. 8, 1977. Patented Feb. 13, 1979. Not available NTIS.

Patent 4,140,972. System for Synchronizing Synthesizers of Communication Systems. Filed Apr. 11, 1977. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,141,219. Method and Turbine for Extracting Kinetic Energy From a Stream of Two-Phase Fluid. Filed Oct. 31, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,141,224. Closed Loop Spray Cooling Apparatus. Filed Aug. 31, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,141,259. Sequenching Device Utilizing Planetary Gear Set. Filed Feb. 25, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,142,101. Low Intensity X-Ray and Gamma-Ray Imaging Device. Filed July 20, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,142,119. Rotary Electric Device. Filed Mar. 21, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,143,314. Closed Loop Solar Array-Ion Thruster System With Power Control Circuitry. Filed Mar. 29, 1978. Patented Mar. 6, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 6–010,093. Integral Enable-Disable Means for Guided Wave Radar Intrusion Detector System Portals. Filed Feb. 7, 1979.

Patent application 6–015,382. Hydraulic Decelerator With Segmented Cylinder. Filed Feb. 26, 1979.

Patent application 966,680. Ready Pressure Attachment for Existing Anti-G Valves. Filed Dec. 5, 1978.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 825,994. Method and Apparatus for Determining the Direction of Maximum Permeability in Subsurface Earth Formation. Filed Aug. 19, 1977.

Patent application 868,633. Tunable, Rare Earth-Doped Solid State Lasers. Filed Jan. 11, 1978.

Patent 4,075,632. Interrogation, and Detection System. Filed May 24, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,095,580. Pulse-Actuated Fuel-Injection Spark Plug. Filed Oct. 22, 1976. Patented June 20, 1978. Not available NTIS.

Patent 4,095,650. Method for Increasing the Calorific Value of Gas Produced by the In Situ Combustion of Coal. Filed Aug. 10, 1977. Patented June 20, 1978. Not available NTIS.

Patent 4,104,037. Gaseous Diffusion System. Filed Sept. 23, 1957. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,111,017. Manually Operated Coded Switch. Filed June 21, 1977. Patented Sept. 5, 1978. Not available NTIS.

Patent 4,115,311. Nuclear Waste Storage Container With Metal Matrix. Filed Mar. 10, 1977. Patented Sept. 19, 1978. Not available NTIS.

Patent 4,118,057. Reusable, Tamper-Indicating Seal. Filed Feb. 24, 1978. Patented Oct. 3, 1978. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent 4,150,236. Steroidal Intermediates From the Condensation Product of Dimethyl-3-Ketoglutarate and Glyoxal. Filed July 19, 1977. Patented Apr. 17, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent 4,136,617. Electronic Delay Detonator. Filed July 18, 1977. Patented Jan. 30, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent 3,215,313. Low Heat Leak Connector for Cryogenic System. Filed Oct. 1, 1964. Patented Nov. 2, 1965. Not available NTIS.

Patent 3,224,337. Hypervelocity Gun. Filed June 7, 1962. Patented Dec. 21, 1965. Not available NTIS.

Patent 3,262,694. Solar Cell Module Assembly Jig. Filed June 10, 1963. Patented July 26, 1966. Not available NTIS.

Patent 3,310,765. Stable Superconducting Magnet. Filed July 26, 1965. Patented Mar. 21, 1967. Not available NTIS.

Patent 3,356,917. Dynamic Capacitor Having a Peripherally Driven Element and System Incorporating the Same. Filed July 16, 1965. Patented Dec. 5, 1967. Not available NTIS.

Patent 3,390,528. Fluid Thrust Control System. Filed Sept. 8, 1966. Patented July 2, 1968. Not available NTIS.

Patent 3,397,537. Rocket Injector Head. Filed Sept. 14, 1966. Patented Aug. 20, 1968. Not available NTIS.

Patent 3,429,756. Method for the Preparation of Inorganic Single Crystal and Polycrystalline Electronic Materials. Filed Feb. 5, 1965. Patented Feb. 25, 1969. Not available NTIS.

Patent 3,481,802. Method and Apparatus for Preparing Multiconductor Cable With Flat Conductors. Filed Sept. 26, 1966. Patented Dec. 2, 1969. Not available NTIS.

Patent 3,485,290. Method of Making a Rocket Nozzle. Filed Sept. 14, 1966. Patented Dec. 23, 1969. Not available NTIS.

Patent 3,511,680. Edge Coating of Flat Wires. Filed July 5, 1966. Patented May 12, 1970. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 28, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-8-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-18-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins: Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	10-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	6-21-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-6-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-19-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	4-10-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-12-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-7-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-31-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-21-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-1-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	9-25-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-21-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-9-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-16-78

Expiration of patents: The patents within the range of numbers indicated below expire during July 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,041,614 to 3,047,872, inclusive
Plant Patents..... Numbers 2,155 to 2,159, inclusive

REISSUES

OCTOBER 9, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

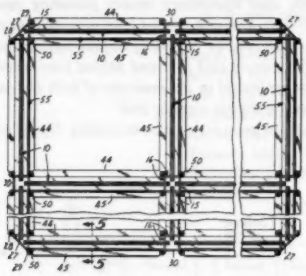
Re. 30,108
BIN PANEL CONSTRUCTION

Wayne H. Oliver, 1305 Spring Valley Rd. North, Minneapolis, Minn. 55422

Original No. 3,521,420, dated Jul. 21, 1970, Ser. No. 830,166, Apr. 1, 1969. Continuation-in-part of Ser. No. 722,299, Apr. 18, 1968, abandoned. Application for reissue Apr. 26, 1977, Ser. No. 790,921

Int. Cl.[2] **E04C** *2/38*

U.S. Cl. 52—584 **10 Claims**



1. A bin panel comprising:

(a) a generally rectangular, imperforate sheet having first and second sides and having a top edge, a bottom edge, and a pair of side edges connecting said top and bottom edges;

(b) a side frame attached to each of said pair of side edges of said sheet for connecting said bin panel to the side edges of other bin panels;

(c) a bottom frame member comprising a pair of bottom sections on said first and second sides of the plane of said sheet, said bottom sections having a channel member portion to lend rigidity to said sheet and a connector portion extending downwardly therefrom;

(d) means for spacing said connector portions a distance apart generally equal to the thickness of said sheet; and

(e) one of said bottom sections being integrally formed with said sheet, and the other connected thereto.

Re. 30,109
HYDROACOUSTIC APPARATUS AND VALVING MECHANISMS FOR USE THEREIN

John V. Bouyoucos, Rochester; Roger L. Selsam, Fairport, and Dennis R. Courtright, Canandaigua, all of N.Y., assignors to Hydroacoustics Inc., Rochester, N.Y.

Original No. 4,005,637, dated Feb. 1, 1977, Ser. No. 522,977, Nov. 11, 1974. Application for reissue Aug. 5, 1977, Ser. No. 822,112

Int. Cl.[2] **F01L** *17/00, 25/04;* **F01B** *7/18*

U.S. Cl. 91—276 **12 Claims**

1. An impact tool for producing percussive forces for application to a load which comprises

a housing having a generally cylindrical opening therein,

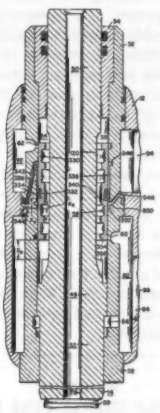
a hammer mounted in said opening for oscillatory movement in opposite directions axially of said opening toward and away from an impact position, said hammer and said housing including a side wall defining in said opening an annular cavity,

a valve mechanism *for* modulating the flow of hydraulic fluid into and out of said cavity for producing pressure variations therein for sustaining the oscillations of said hammer,

said valve mechanism including a valve element mounted in said cavity for movement in opposite directions axially of said cavity,

pressurized hydraulic fluid supply and return means in said housing including supply and return ports [into] *entering* said cavity spaced from each other in a direction axially of said cavity and disposed in porting relationship with said valve element [to] *for* alternatively [open] *opening* and [close] *closing* said ports as said valve moves in said opposite diections,

said hammer having a radially extending portion which engages said valve element when said hammer moves in one of said opposite directions and *which* moves said valve element therewith in said one of said opposite directions *to a first switching position where the one of said ports which is open is closed by said valve element and the other of said ports which is closed is opened by said valve element, said valve element and said hammer being free to move in said*



one of said opposite directions past said first switching position over different trajectories, said hammer in its trajectory being spaced away from and never blocking any of said ports,

said valve element and the side wall of said housing which defines said cavity forming a chamber therebetween extending axially of said housing, said valve element having a portion extending radially [into said chamber] and presenting an area *in said chamber* in a plane perpendicular to the axis of said housing,

means communicating with at least one of said pressurized hydraulic fluid supply and return means for providing *continuous* communication between said chamber and said *one of* supply and return means for applying *net* hydraulic forces acting [continuously] *only* in the other of said opposite directions upon said valve element to move said valve element [continuously] in the other of said opposite directions *as said valve element travels over its trajectory between said first switching position and a second switching position where it opens the said one of said ports which it closes at said first switching position and closes said other of said ports which opens at said first switching position.*

Re. 30,110
FAIL-SAFE SAFETY CUT-OFF VALVE FOR A FLUID WELL

Donald L. Huebsch, 3716 Prestwick Dr., Los Angeles, Calif. 90027, and Louis B. Paulos, 9616 Yolanda Ave., Northridge, Calif. 91324

Original No. 4,002,202, dated Jan. 11, 1977, Ser. No. 616,189, Sep. 24, 1975. Application for reissue May 9, 1977, Ser. No. 794,800

Int. Cl.[2] **E21B** *43/00;* **F16K** *31/06, 17/34*

U.S. Cl. 166—65 M **38 Claims**

18. A fail-safe safety cut-off valve for a fluid well tubing string comprising: a tubular housing insertable between the adjacent ends of contiguous sections of a conventional tubing string, a cut-off valve sub-assembly embraced by and mounted within said tubular housing and including coupling means interiorly of said tubular housing holding said valve sub-assembly detachably coupled as a unit to said tubular housing and, when uncoupled, permitting withdrawal of said valve sub-assembly as a unit through a tubing string, said valve sub-assembly including valve seat means and pivoting valve means biased toward closed position thereagainst, solenoid means for opening and retaining said valve means open comprising tubular armature means mounted within and reciprocal axially of said housing between an extended position wherein said valve means is closed on said valve seat means and a retracted position wherein said valve means is held open, means for shifting said armature means to said extended position, and solenoid coil means operable when energized to shift said armature means to said retracted position to open and retain said valve means in open position.

Re. 30,111
DIGITAL SINGLE SIGNAL LINE FULL DUPLEX METHOD AND APPARATUS

William R. Blood, Jr., Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Original No. 3,993,867, dated Nov. 23, 1976, Ser. No. 514,526, Oct. 15, 1974. Application for reissue Jul. 28, 1978, Ser. No. 929,761

Int. Cl.[2] **H04L** *5/14*

U.S. Cl. 178—58 R **12 Claims**

1. A digital transmission system comprising:

at least a pair of stations, at least one of said stations having transmitting means and receiving means;

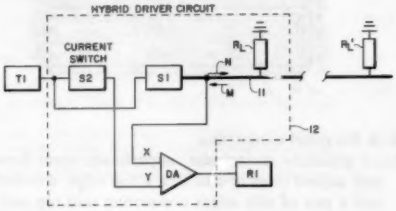
a single bus transmission signal path for carrying [the] incoming and outgoing digital signals and operatively connectable to said transmitting and said receiving means[;], *the outgoing digital signals corresponding to a first and a second logic state;*

first means for applying the outgoing digital signals from said transmitting means to said path, said first means including current source means for supplying a constant current and [said] first switch means operating to supply or cut off said *constant* current from said path in accordance with the shifting pattern of the outgoing digital signals between its two states;

second means for combining the outgoing digital signals and incoming digital signals in said path to form a composite signal which shifts between a plurality of predetermined amplitude levels;

impedance means connected to said path for providing IR voltage drops using current from the digital signals present in said path, said impedance means providing potential level shifts between first and second level potentials in the presence of either outgoing or incoming digital signals and potential level shifts among said first and second level potentials and a third level potential in the presence of both the outgoing and the incoming digital signals; and

third means for recovering the incoming digital signals from



the composite signal and applying the recovered incoming digital signals to said [receiver] *receiving means,* including second switch means, means for operating said second switch means in response to the outgoing digital signals from [the transmitter] *said transmitting means* for generating digital indication signals which are the same in signal content as that of the outgoing digital signals and which shift between fourth and fifth level potentials, and comparing means having first and second input means, *the* first input means *being* for receiving the composite signal found in said [line] *path* and *the* second input means *being* for receiving said digital [indicating] *indication* signals [and], *said comparing means being for comparing the composite signal to said digital indication signals and* deriving an output from the comparison in the form of incoming digital signals from said path[; and]

[impedance means connected to said path for providing IR voltage drops using the current from the digital signals present in said path, said impedance means providing potential level shifts between first and second potentials in the presence of either outgoing or incoming digital signals and potential level shifts among said first and second level potentials and a third level potential in the presence of both the outgoing and the incoming digital signals].

PLANT PATENTS

GRANTED OCTOBER 9, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,463

ROSE UNDERSTOCK—FREDICA VARIETY

Claude Goujon, Versailles, France, assignor to Conard-Pyle Company, West Grove, Pa.

Filed Sep. 5, 1978, Ser. No. 939,259

Int. Cl.[2] **A01H** *5/00*

U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant produced by the crossing of a *Rosa indica major* seed parent by the thornless male, *Rosa multiflora inermis,* characterized particularly as to novelty by the unique combination of (a) a substantially thornless nature, (b) a multiflorous inflorescence, (c) white flowers commonly of five petals each, (d) foliage similar to but more ample than that of *Rosa indica major,* (e) good tolerance to diseases including powdery mildew, and (f) exceptional suitability for use as understock for growing rose plants in a greenhouse.

PATENTS

GRANTED OCT. 9, 1979

ERRATA

For CLASS	See PATENT NO.
303–114	4,170,066
409–013	4,170,164
137–269	4,170,214
192–048.91	4,170,276
198–844	4,170,281
414–241	4,170,310
414–289	4,170,311
229–017 B	4,170,325
224–324	4,170,331
269–003	4,170,343
292–201	4,170,374
406–059	4,170,385
414–111	4,170,426
403–020	4,170,430
423–215.5	4,170,447
435–055	4,170,518
435–012	4,170,519
435–288	4,170,520
252–008.6	4,170,557
548–229	4,170,594
525–100	4,170,610
525–494	4,170,611
525–101	4,170,612
525–403	4,170,613
423–430	4,170,658
220–346	4,170,724
200–067 F	4,170,730
367–100	4,170,765
367–135	4,170,766

PATENTS

GRANTED OCT. 9, 1917

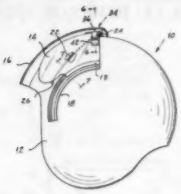
ERRATA

PATENTS

GRANTED OCTOBER 9, 1979

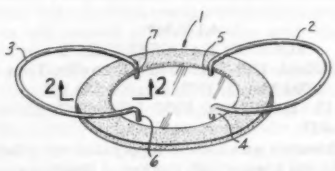
GENERAL AND MECHANICAL

4,170,042
READILY RELEASABLE POWERED VISOR-AND-LOCK ASSEMBLY FOR HELMET
Jackson A. Aileo, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.
Filed Feb. 6, 1978, Ser. No. 875,179
Int. Cl.[2] A42B *3/00*
U.S. Cl. 2—424 **18 Claims**



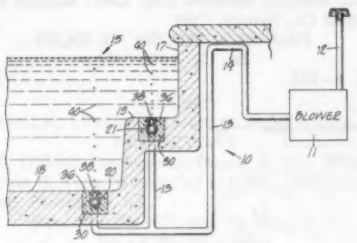
1. A helmet-and-visor assembly including in combination, a helmet adapted to be received by the head of a wearer, a visor, means mounting said visor on said helmet for movement between a raised position clear of the eyes of the wearer and a lowered position in front of the eyes of the wearer, resilient means for positively biasing said visor for movement from said raised position to said lowered position, said resilient means comprising an elastic cord secured between said visor and said helmet, and readily manually releasable means for holding said visor in said raised position against the action of said biasing means.

4,170,043
COATED INTRAOCULAR LENS AND SURGICAL TOOL
Patricia M. Knight, Costa Mesa, and William J. Link, Irvine, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Nov. 30, 1977, Ser. No. 855,961
Int. Cl.[2] A61F *1/16, 9/00, 1/24;* A61B *17/28*
U.S. Cl. 3—13 **42 Claims**



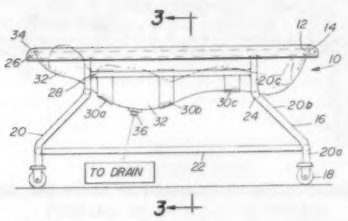
1. An intraocular lens having a surface likely to contact a corneal endothelium during ophthalmic surgery, wherein the improvement comprises: a biocompatible water-soluble adherent film coating on such surface for protecting the corneal endothelium, said coating having a dissolution rate sufficiently slow so that at least 40% of the coating is maintained on the device for at least 30 minutes when submerged in an aqueous media at room temperature that has a volume simulating that of the aqueous humor.

4,170,044
HYDROTHERAPY APPARATUS AND DUCTING THEREFOR
Wayne D. Steimle, 8808 E. Las Tunas Dr., San Gabriel, Calif. 91776
Filed Aug. 14, 1975, Ser. No. 604,602
Int. Cl.[2] A61H *33/02;* E04H *3/18*
U.S. Cl. 4—172.15 **1 Claim**



1. Hydrotherapy apparatus for bubbling air outwardly into the water of a hydrotherapy pool from a multiplicity of round air discharge perforations, said apparatus comprising ducting of keyhole shape in cross section and including a cylindrical portion opening radially into a slot-like portion having a bottom formed by a cross wall, said ducting being adapted to be embedded in cementitious material except for said cross wall which is left exposed and generally flush with a submerged interior surface of the hydrotherapy pool walls and with the remainder of said ducting permanently embedded in said cementitious material, said cross wall of said slot-like portion of said ducting being imperforate when installed and being thereafter provided with a multiplicity of round air discharge perforations for dispersing bubbles of air outwardly into the pool water, said ducting being closed except for said air discharge perforations and in communication with a source of pressurized air via duct means opening into a midlength portion of said air dispensing ducting and having a portion thereof located above the water level in said pool, and a portion of said air dispensing ducting being embedded in the bottom wall of said pool and another portion thereof being embedded in a seat portion of the pool wall.

4,170,045
HOSPITAL BATHTUB
Judith K. Estes, 726 Ingleside, Flint, Mich. 48507
Filed Jun. 9, 1978, Ser. No. 914,025
Int. Cl.[2] A47K *3/06*
U.S. Cl. 4—177 R **8 Claims**



1. A hospital bathtub, comprising:
(a) a supporting frame;
(b) an outer tub supported on the frame and mounted thereonto the tub being contoured to define its greatest depth at

a user's torso, the tub including a lower extremity support area, a raised back support portion and a head rest, the outer tub adapted for storing a bathing solution therewithin, and

(c) an inner tub removably seatable within and supported by the outer tub and having a contour substantially identical to that of said outer tub, the inner tub having a plurality of perforations formed along the bottom thereof, the bathing solution being capable of entering the inner tub through the perforations.

4,170,046

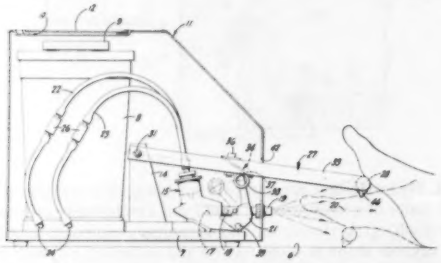
FOOT LIQUID DISPENSER

Grant G. Mattison, Redwood City, Calif., assignor to Jones-Hamilton Co., Newark, Calif.

Filed Aug. 4, 1978, Ser. No. 930,910

Int. Cl.[2] A47K *5/12*

U.S. Cl. 4—182 **9 Claims**



1. A foot liquid dispenser comprising a base, a liquid reservoir on said base, a liquid sprayer mounted on said base to discharge at a predetermined height above said base and in a predetermined direction, means for connecting said sprayer to said reservoir, a lever for operating said sprayer, a bail having a pair of spaced-apart side arms connected by a transverse bar, means for pivoting said side arms on said base on opposite sides of said sprayer and for rotation about a transverse axis normal to said direction and parallel to said bar and with said bar disposed beyond said sprayer and movable between an upper position above predetermined height and a lower position below said predetermined height, and means interconnecting said bail and said lever.

4,170,047

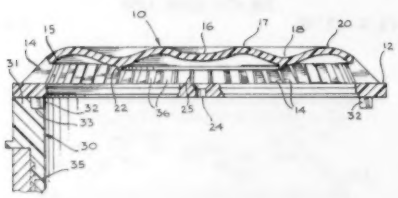
VANED ANTI-VORTEX POOL DRAIN COVER

Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045, and Frank J. Jedlick, 8251 Seville Ave., Apt. B, Southgate, Calif. 90280

Filed Jun. 30, 1978, Ser. No. 920,672

Int. Cl.[2] A47K *1/14*

U.S. Cl. 4—293 **27 Claims**



1. A drain cover for a swimming pool or the like, comprising:

an annular support ring adapted for attachment to a drain housing; and

a cover portion displaced from the plane of the ring and joined thereto by a plurality of generally equally spaced, radially-directed support stanchions defining a plurality of openings about the periphery of the cover, the cover portion comprising a central, curved, recessed section smoothly joined to the surrounding remainder of the cover portion, said cover portion being continuous throughout its extent and symmetrical about the central axis of the cover.

4,170,048

TOILET INSTALLATION

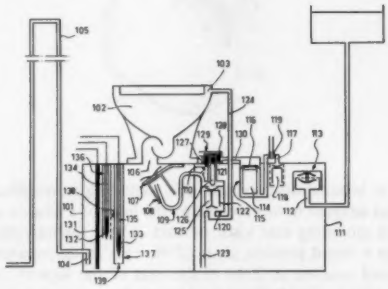
Alain Anthony, Parc Offenbach, 33, rue Cartault, 92800 Puteaux, France

Filed Jan. 18, 1977, Ser. No. 760,397

Claims priority, application France, Jan. 20, 1976, 76 01406

Int. Cl.[2] E03D *3/10, 5/02*

U.S. Cl. 4—321 **16 Claims**



1. In a toilet installation comprising a toilet fixture, a discharge tank disposed beneath said toilet fixture and having a drain orifice and an inlet orifice with said inlet orifice being in fluid communication with said fixture, an obturating member for sealingly mating with an edge defining said inlet orifice to seal off said inlet orifice, a source of compressed air, conduit means connecting said compressed air source to said discharge tank for pressurizing said discharge tank and expelling effluent including waste matter through said drain orifice, a plurality of electrical level detecting means disposed in said discharge tank, at least one of said electrical level detecting means being a level detector housed within a vertical fluid-tight protective tube having an open lower end, and automatic control means responsive to the rise of effluent under pressure upwardly in said one protective tube and the detector therein for maintaining said discharge tank under pressure until effluent has dropped below the detector in said one protective tube and effluent has been expelled from said discharge tank through said drain orifice.

4,170,049

AQUALOCK CLOSET VALVE

Elbert G. Gilliland, 1801 Francis Rd., Knoxville, Tenn. 37919

Filed Mar. 3, 1978, Ser. No. 883,163

Int. Cl.[2] E03D *11/00;* **E03C** *1/242;* **F16K** *21/18*

U.S. Cl. 4—427 **5 Claims**

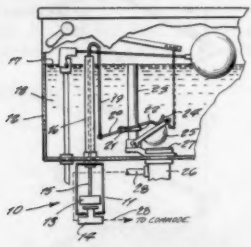
1. In combination with a water supply tank and a flush toilet commode having a water path connected therebetween and a drain valve located in said water path between said supply tank and said toilet commode, an independent aqualock closet valve connected in parallel to said water path for preventing the overflow of the toilet commode, said aqualock closet valve comprising:

an auxiliary float chamber located below said water supply tank and at a position corresponding to a selected upper portion of said toilet commode;

a first conduit for conducting water between said auxiliary flow chamber and said toilet commode; and

means for stopping the flow of fresh water from said supply

tank to said commode when the water level in said toilet commode results in a corresponding rise of water in said auxiliary float chamber, said means for stopping comprising a float located within said chamber, a pipe extending from said auxiliary float chamber through the bottom of said supply tank and upwardly into the interior of said tank to a level greater than the water level of said tank, a connecting rod having a first and second end, said first end



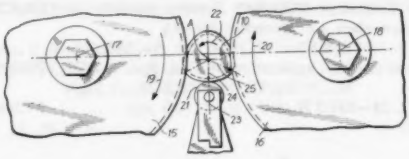
being attached to said float, said rod extending through said pipe and being formed such that said second end extends downwardly, and means attached to said second end for bearing against said drain valve such that water rising to a selected level in said toilet commode results in a corresponding rise in water in said auxiliary float chamber which raises said float means and thereby closes said drain valve connected thereto.

4,170,050

METHOD OF MAKING LOBULAR INTERNALLY AND EXTERNALLY THREADED INSERT

Robert W. Bosse, Englewood Cliffs, N.J., assignor to Groov-Pin Corporation, Ridgefield, N.J.

Filed Jun. 7, 1978, Ser. No. 913,469
Int. Cl.[2] B21H *3/04*; B23G *7/00*
U.S. Cl. 10—10 R **3 Claims**



1. The method of making a lobular, internally and externally threaded insert which comprises:

(a) forming a length of metallic stock material into a uniform lobular cross-sectional configuration characterized in that:
1. an odd number of arcuate lobes more than one are defined of said material; and
2. said lobes are of uniform circumferential extent; and
3. the width of said material is substantially constant;

(b) forming a plurality of longitudinally spaced-apart, circumferentially indented lobular chamfer portions on said material, said chamfer portions being disposed normal to the longitudinal axis of said material and forming continuations of the profile of said material;

(c) progressively advancing said material between a driven pair of cylindrical thread forming dies, the peripheries of said dies at the closest point of approach thereof being spaced apart a distance less than the width of said material, said dies being each in driving engagement with a different one of said lobes while said material is supported on a surface spaced from a line extending between the peripheries of said dies at said closest point of approach a distance greater than half but less than the entire width of said material, thereby to cause said material progressively to be advanced in a helical path while forming threads on said driven lobes and on parts of said chamfer portions without distorting the profile of said material at the crests of said threads;

(d) drilling progressive increments of said externally threaded material along a line coincident with the axis thereof while said increments are integral with said material;

(e) sequentially tapping said drilled increments of said material to form an internal thread therein; and

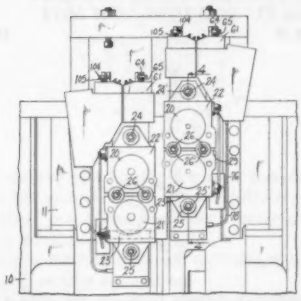
(f) thereafter severing said drilled and tapped increments of said material by cuts formed transversely through said material along lines adjacent said chamfers.

4,170,051

HYDRAULIC AND MECHANICAL PUNCH HOLDER ADJUSTMENT

George F. O'Keefe, Southington; Donald A. Roy, Waterbury, and Erwin B. Byam, Wolcott, all of Conn., assignors to Textron Inc., Providence, R.I.

Filed Oct. 25, 1977, Ser. No. 845,126
Int. Cl.[2] B21K *1/44*
U.S. Cl. 10—12.5 **16 Claims**



1. Means for adjusting the position of a punch carried by a vertically movable slide in a header having releasable means for fixing the punch in operative position, comprising, for each punch, a backing plate slidably adjustable laterally relative to the slide, a punch carrier slidably adjustable vertically relative to the backing plate, means for applying oppositely vectored vertical forces to the punch carrier, means for applying oppositely vectored horizontal forces to the backing plate, means for actuating selectively said force applying means, all said actuating means being located remote from the points of application of said forces and in readily accessible positions adjacent the top of the slide, and force transmitting means operatively connecting said actuating means with the respective force applying means.

4,170,052

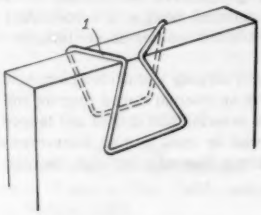
HOLDING CLIP

Charles L. Okerblom, 20 Welch Rd., Warwick, R.I. 02889

Filed Dec. 29, 1977, Ser. No. 865,422
Int. Cl.[2] B42F *1/02*; A44B *21/00*
U.S. Cl. 24—67.9 **8 Claims**

1. A wireform holding clip consisting of a front frame with horizontal base and sides angled inward to the center at the top and continuous with cantilever top members extending out-

ward and slightly back from the front frame plane and continuous with side members of a rear frame, said side members



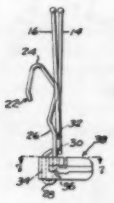
angled inward and downward and continuous with a horizontal member forming the base of the rear frame.

4,170,053

DRAPERY PLEATER HOOK

Philip Rosenzweig, 23119 Riverside Dr., Southfield, Mich. 48034

Filed Nov. 21, 1977, Ser. No. 853,323
Int. Cl.[2] A44B *13/00*; A47H *13/14*
U.S. Cl. 24—84 R **16 Claims**



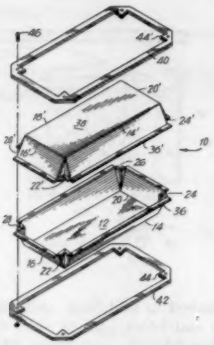
1. In combination, a pleater hook for use with a drapery panel having a plurality of vertically extending pockets at the upper end thereof, the pockets being open at their lower ends, comprising, a series of four vertically extending, laterally spaced fingers all interconnected to one another in fixed relation adjacent their lower ends and adapted to be inserted upwardly into said pockets to form a pleat having three vertically extending folds at the upper ends of the drapery which project forwardly from the pleater hook, means attached to said fingers adjacent their lower ends and forming a rearwardly projecting support hook on the rear side of the pleater hook for suspending the pleater hook on a drapery rod, and a pleat pinching attachment fixedly supported on said hook and located below the interconnections between the lower ends of said fingers when in pleat pinching position, said attachment having a pair of relatively rigid arms thereon projecting forwardly of the pleater hook, said arms being swingable horizontally toward and away from each other between closed pleat pinching position and opened pleat receiving position, and releasable locking means on said attachment engageable with said arms for retaining them in said closed pleat pinching position, whereby, when the fingers are inserted into said pockets with said arms in the opened pleat receiving position and projecting forwardly into the two outer folds of the pleat with the center fold disposed therebetween, the arms are adapted to be swung inwardly toward each other and locked in said closed position by said locking means to tightly pinch and compress the three folds together at the location of said attachment below the interconnections between the lower ends of the fingers.

4,170,054

CASKET

Arno Ruffner, Haldenstrasse 33, CH-2555 Bruegg, and Roland Siegfried, Promenade de la Suze, CH-2502 Biel-Bienne, both of Switzerland

Filed Aug. 8, 1977, Ser. No. 822,570
Int. Cl.[2] A61G *17/00*
U.S. Cl. 27—4 **8 Claims**



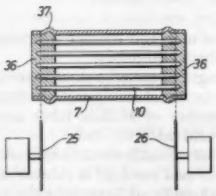
1. A casket comprising an open box member folded and shaped to carry a body, a closure member for closing said box member, a rigid perimeter frame for holding together said box member and said closure member, said box member comprising a rectangularly shaped box having four corners, each of said corners being folded inwardly to form a reentrant section, said perimeter frame having four inwardly directed projections, each of which is shaped to fit a corresponding reentrant section on said box member to provide additional stiffness for the casket.

4,170,055

METHOD AND APPARATUS FOR MANUFACTURING A HEAT EXCHANGER

Claude Zethraeus, Ekbacken, Sweden, assignor to AGA-CTC Varmevaxlare AB, Ronneby, Sweden

Filed Mar. 13, 1978, Ser. No. 885,973
Claims priority, application Sweden, Apr. 1, 1977, 7703800
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 R **9 Claims**



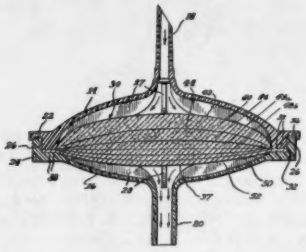
1. A method of manufacturing a heat exchanger comprising a plurality of pipes connected in parallel relative to a medium flowing therethrough, characterised in that a plurality of pipes taken from a magazine are charged to a shell blank for forming an outer shell, said shell blank being open at both ends thereof and having a slot extending axially therealong; that the shell blank is compressed radially until the axial opening is closed, whereafter the thus contacting surfaces of said opening are welded together; that each end of the package of pipes comprising said shell with the pipes located therein, is immersed in a casting mass such that said mass surrounds the pipe ends and the space therebetween and the inner surface of the shell; that the casting mass is caused to solidify; that each end of the pipe

package is severed along a line located in the casting mass such that the ends of respective pipes are opened; and in that cup-shaped members having connections provided thereon are connected to each end of the pipe package.

4,170,056
BLOOD FILTER

Richard P. Meyst, Crystal Lake, and Ronald M. Porten, McHenry, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 670,317, Mar. 25, 1976, abandoned. This application Jun. 6, 1977, Ser. No. 803,696
Int. Cl.[2] B23P *15/16*
U.S. Cl. 29—163.5 F **7 Claims**

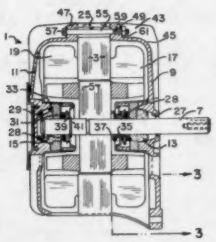


1. The method of manufacturing a filter which comprises assembling a stack of filter pads comprising thermoplastic fibers, and including a first pad defining an upstream outer surface and a last pad defining a downstream outer surface, heat sealing the peripheries of said pads in the stack together to form an integral filter unit defining an integral periphery, and thereafter inserting and sealing said filter unit into a filter housing by forming a seal between said integral filter unit and the filter housing along said integral periphery.

4,170,057
METHOD OF MAKING A DYNAMOELECTRIC MACHINE

Joseph T. Roddy, Ballwin, and William R. Butler, Fenton, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 22, 1977, Ser. No. 780,228
Int. Cl.[2] H02K *15/14*
U.S. Cl. 29—596 **11 Claims**

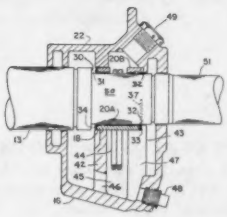


1. In the process of manufacturing a dynamoelectric machine having a stator including a stator core composed of a plurality of laminations, a rotor, an annular air gap between the stator core and rotor, a rotor shaft, a pair of end shields carrying rotor shaft journaling bearings, and a plurality of tension elements for holding the end shields axially to said stator, said process including a step of assembling said rotor and said stator with said rotor and said stator core aligned by temporary means for establishing a uniform annular air gap between them, a step of attaching said end shields by positioning said end shields with at least one radial face of each end shield engaging a radial face of said stator and with said rotor shaft extending into said bearings to position said end shields radially with respect to said stator and tightening said tension elements, and thereafter a step of removing said temporary means to produce a mechanically finished motor for use, the improvement wherein said bearings are self-aligning bearings, and wherein said tension elements are tightened sufficiently that radial movement of said end shields with respect to said stator is prevented solely by frictional forces between said radial faces of said end shields and said radial faces of said stator core in the use of said motor after said temporary means are removed.

4,170,058
METHOD OF ADJUSTING END PLAY

James M. Leffler, Hiram, Ohio, assignor to Reliance Electric Co., Cleveland, Ohio

Division of Ser. No. 708,387, Jul. 26, 1976. This application Nov. 2, 1977, Ser. No. 847,850
Int. Cl.[2] H02K *15/16*
U.S. Cl. 29—596 **14 Claims**



1. The method of adjusting the axial end-play of a shaft-mounted rotor and a stator in a dynamoelectric machine having the stator in a frame receiving a bearing, said method comprising the steps of,

providing in the frame bearing receiving means of an axial length to receive the bearing,

assembling the machine and running the machine to cause the rotor and shaft assembly to have any axial shift due to magnetic action with the stator,

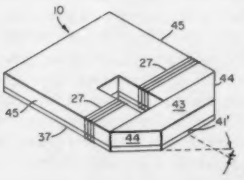
stopping the machine, and

relatively axially locating the bearing and one of the rotor and stator.

4,170,059
METHOD OF MANUFACTURING A MAGNETIC TRANSDUCER FOR NARROW TRACK RECORDING AND PLAYBACK

Beverley R. Gooch, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Division of Ser. No. 615,532, Sep. 22, 1975, Pat. No. 4,115,827. This application Mar. 13, 1978, Ser. No. 885,834
Int. Cl.[2] G11B *5/42*
U.S. Cl. 29—603 **21 Claims**



1. A method of manufacturing a magnetic transducer suit-

able for recording and reproduction on narrow tracks of a magnetic medium, comprising the steps of:

(a) forming a magnetic core having at least two complementary magnetic poles defining a nonmagnetic gap therebetween and two opposite surfaces each extending over said magentic poles and said nonmagnetic gap to define a core width greater than the width desired for a transducing gap, at least one said opposite surface being a planar surface;

(b) forming a composite body comprising a nonmagnetic front portion and a contiguous magnetic back portion having two opposite surfaces each extending over both said magnetic and nonmagnetic portions, at least one said opposite surface being a planar surface;

(c) integrally joining an opposite planar surface of said magnetic core with a confronting opposite planar surface of said composite body to form an integral transducer body with said nonmagnetic front portion of said composite body adjacent to and spanning said nonmagnetic gap of said magnetic core; and

(d) reducing the width of said transducer body at the other one, exposed, opposite surface of said magnetic core in a plane substantially parallel with its integrally joined surface until the desired transducing gap width is obtained.

4,170,060

SHEAR-HEAD FOR DRYSHAVERS

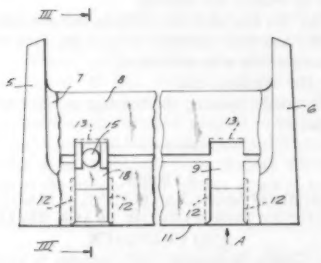
Gunther Seidel, Frankfurt am Main, and Christian Schmieder, Schwalbach, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 17, 1977, Ser. No. 825,426

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637302

Int. Cl.² B26B *19/04*

U.S. Cl. 30—43.92 **5 Claims**



1. A shear-head for dryshavers, comprising a cupped frame having an interior space bounded by inner frame surfaces, and an opening communicating said interior space with the exterior of said frame; a flexible apertured shear foil; and means forming a unit with said frame for detachably mounting said flexible apertured shear foil on said frame so that it arcuately spans said opening, said mounting means comprising at least one recess in each of two oppositely located ones of said inner frame surfaces, and at least a pair of mounting plates each matingly received in one of said recesses, said recesses and the associated mounting plates being provided with interengageable undercut portions, each mounting plate being provided with at least one projection extending from the respective mounting plate inwardly of said interior space and to which an edge portion of the shear foil is connected so that said mounting plates remain stationary in place in the corresponding recesses upon withdrawing of the shear foil from said opening of the frame.

4,170,061

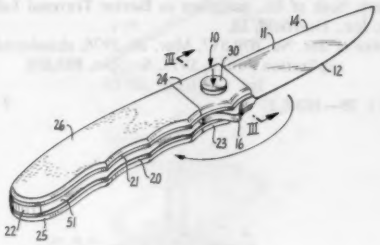
LOCKING MECHANISM FOR FOLDING POCKET KNIFE

Daniel E. Henry, Mountain Ranch, Calif. 95246

Filed Jun. 12, 1978, Ser. No. 914,189

Int. Cl.² B26B *1/04*

U.S. Cl. 30—160 **5 Claims**



1. A folding knife with a locking mechanism for locking the same in the open and in the closed positions, said knife having a blade with ricasso and a cutting edge and a handle for receiving the blade and cutting edge when in the closed position, said handle comprising a pair of liners at either side of the blade, spaced apart a sufficient distance along the inner edge by a spacer to provide a protected housing for the blade in the closed position, a pair of bolsters and scales overlaying the outer surfaces of each liner, a transverse axial line passing through the bolsters, liners and blade which represents the pivot of the blade from the open to the closed positions and vice versa, said bolster on one side having a through bore and the opposite bolster having an inner counterbore of substantially the same diameter forming a well axially aligned with said pivot, through bores similarly aligned but of smaller diameter in the liners and the blade each with identical radially extending squared slots exactly 180° from each other and in axial registry, the locking means comprising a depressible plunger removably secured within said through bores having a bottom slot for receiving and axially guiding a pressure bar, a pressure bar, a resilient member in said well bearing against said pressure bar allowing limited axial movement, said pressure bar also guiding in said square slots in a locked position and released from engagement with the blade slots to permit rotation from the open to the closed positions, or vice versa, by axial pressure against the resilient member.

4,170,062

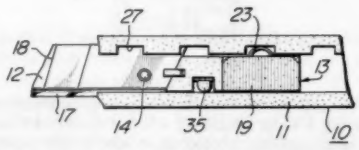
EXTENSIBLE KNIFE WITH BLADE POSITION ADJUSTMENT

Naoyosi Machida, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Gifu, Japan

Filed Jul. 6, 1978, Ser. No. 922,375

Int. Cl.² B26B *1/08, 5/00*

U.S. Cl. 30—162 **4 Claims**



1. A knife apparatus comprising an elongated handle member having longitudinal edge portions bent in opposition to each other so as to define a channel, one of said longitudinal edge portions being formed with a plurality of successive notches, a blade holder having a blade secured thereto and

adapted to be slidably accommodated within said channel so that said blade is moved relative to said handle member, and locking means mounted on said blade holder and having a V-like leaf spring member an apex portion of which is adapted to selectively and releasably engage in one of said notches thereby to lock said blade holder to said handle, wherein said locking means further includes securing means for releasably securing said V-like spring member fixedly at said locking position so that said apex portion of said spring member be prevented from being disengaged from said selected notch.

4,170,063

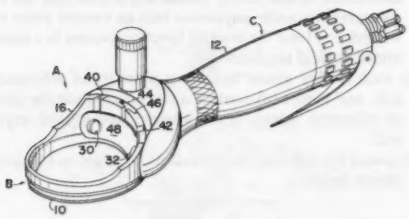
KNIFE WITH REMOVABLE BLADE HOUSING

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

Continuation-in-part of Ser. No. 924,914, Jul. 17, 1978. This application Nov. 15, 1978, Ser. No. 960,965

Int. Cl.[2] A22C *17/04, 17/12*

U.S. Cl. 30—276 **2 Claims**



1. A hand knife comprising a handle assembly having a concave arcuate surface at one end with two tapped apertures opening thereinto, a drive gear adjacent to the arcuate surface of the handle assembly between the tapped apertures opening thereinto and rotatably supported in the handle assembly, a ring-like blade housing member of short axial length having portions of greater axial length at said arcuate surface of the handle assembly than the remainder thereof and having through apertures in the portions of greater axial length, headed and threaded fasteners extending through the apertures in the ring-like member and threaded into the tapped aperture in the handle assembly detachably securing the ring-like blade housing member to the handle assembly, a ring-like blade member rotatably supported in the ring-like blade housing member and having a cutting edge at one end projecting from the ring-like blade housing member and gear teeth at its opposite end in mesh with the drive gear, characterized by the apertures in the ring-like blade housing member being slots opening into the end of the ring-like blade housing member opposite to the end from which the cutting edge of the blade projects, whereby the ring-like blade housing member and the blade carried thereby can be removed from the handle assembly without removing from the handle the screws connecting the ring-like blade housing member to the handle assembly.

4,170,064

HAIR-DRESSING SCISSORS

Heinz Senk, Solingen, Fed. Rep. of Germany, assignor to Spengler & Meurer, Solingen, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,619

Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721672

Int. Cl.[2] B26B *19/22*

U.S. Cl. 30—195 **2 Claims**

1. A hair-dressing scissors comprising

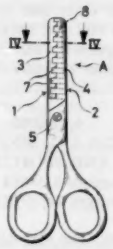
(a) two crossed scissors halves (**1,2**);

(b) a fulcrum screw (**5**) joining said halves to one another;

(c) a scissor blade (**4**) provided with serrations (**7**) having a base and forming tooth gaps having a base;

(d) a scissor blade (**3**) having a smooth cutting edge (**6**), said blades interacting to shear hair, and

(e) a handle formed at each longitudinally inward portion of each blade, the scissor blade having the smooth cutting



edge with the scissors closed extending with its smooth cutting edge beyond the base of the serrations (**7**) of the other scissor blade (**4**) and the inward edges (**9**) at the base of the teeth gaps being rounded.

4,170,065

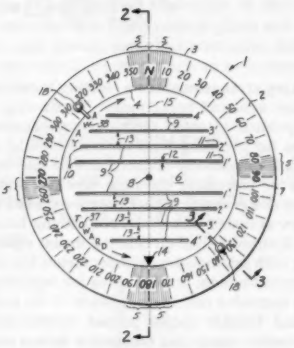
MARINE AZIMUTH AND INTERCEPT PLOTTER INSTRUMENT

Donald W. Hiscott, 434 E. Randolph St., Glendale, Calif. 91207

Filed Aug. 11, 1978, Ser. No. 933,112

Int. Cl.[2] B43L *7/00*

U.S. Cl. 33—431 **5 Claims**



1. A marine navigational azimuth and intercept plotter instrument

combination comprising:

a flat sheet external annular ring having a first exterior circular perimeter, and an interior circular perimeter concentric with said first exterior perimeter, said annular ring having 360° compass marking indicia disposed on said annular ring at least adjacent to said interior circular perimeter, said compass marking divided at least into one degree (1°) values and,

a single flat sheet circular inner disc having a second exterior circular perimeter, said disc disposed in and snugly rotatable inside said interior circular perimeter of said external annular ring,

said circular inner disc having a center aperture disposed through the flat inner disc thickness, said aperture sized and adapted to accomodate a marker point,

said single circular inner disc having multiple linear slot apertures disposed through said disc thickness and also disposed in parallel equal fixed spaced intervals from said center aperture, each said linear slot aperture having a first terminus and a second terminus disposed inside said inner disc adjacent to said inner disc second

exterior perimeter, and each said slot aperture having a width sized and adapted to accommodate a marker point, said parallel equal space intervals being equivalent to a navigation map scalar value of not less than one minute (1.0') of compass value of a specific navigation map,

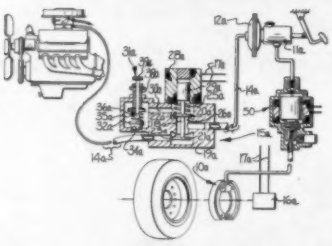
said single circular inner disc having a compass heading line disposed on said disc normal to said multiple parallel linear slot apertures and having a radial extension through said center aperture of said disc.

4,170,066

BRAKING APPARATUS AND METHOD WITH BOOSTER AND SPOILER

Folke I. Blomberg, Duvstigen 4, S-181 40 Lidingo, and Jan-Olov M. Holst, Skogsduvevagen 14, S-75252 Uppsala, both of Sweden

Continuation of Ser. No. 795,540, May 10, 1977, abandoned.
This application Aug. 16, 1978, Ser. No. 934,071
Int. Cl.[2] B60T *8/00, 13/68, 13/72*
U.S. Cl. 303—114 **9 Claims**



1. A braking arrangement for a rotating member comprising fluid pressure actuated brake means for slowing the rotating member, operator actuated means communicating with said brake means for imposing fluid pressure on said brake means, booster means operatively connected with said operator actuated means for increasing the fluid pressure imposed on said brake means to a pressure higher than the pressure imposed by said operator actuated means and comprising booster cylinder means and hydraulic fluid circulating means operatively communicating with said booster cylinder means for imposing fluid pressure forces thereon, sensor means for signalling the occurrence of an excessive rate of retardation of the braked rotating member, and booster spoiler means operatively connected with said booster means and said sensor means and responsive to a signalled occurrence of an excessive rate of retardation for decreasing the fluid pressure imposed by said booster means, said booster spoiler means comprising reversing valve means controllably interposed between said hydraulic fluid circulating means and said booster cylinder means for diverting fluid pressure forces otherwise imposed by said hydraulic fluid circulating means and for reversing the differential of fluid pressure forces imposed thereacross.

4,170,067

APPARATUS FOR MEASURING PIPE LENGTH

Robert A. Yohe, and John F. McIver, both of Steelton, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation of Ser. No. 733,683, Oct. 18, 1976, abandoned.
This application Jan. 10, 1978, Ser. No. 868,572
Int. Cl.[2] G01B *7/02*
U.S. Cl. 33—143 L **20 Claims**

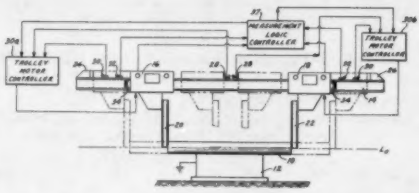
1. Length measuring apparatus, comprising:

(a) first and second trolley means each adapted to be reversibly positioned lengthwise relative an object to be measured, each said trolley means initiating at least one corresponding reference position signal during movement,

(b) first and second end object detector means carried respectively by said first and second trolley means and adapted to produce an object end detecting signal,

(c) first and second pulse generator means each operative in response to movement of a respective trolley means for generating respective length measurement pulse sequences,

(d) measurement logic controller means receiving the reference position signals, the object and detecting signals and the length measurement pulse sequences for controlling



movement of the trolley means and converting the length measurement pulse sequences into an overall pulse count, whereby at least the control function occurs in a predetermined logical sequence,

(e) each trolley means initiates a plurality of reference signals, and means (d) control is circuited to use the plurality of reference signals in a predetermined logical sequence, and

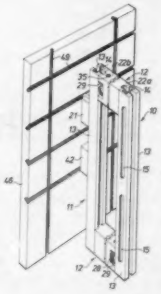
(f) means for utilizing the overall pulse count as a function of object length.

4,170,068

APPARATUS FOR TRANSMISSION OF MEASURING MOTION IN GAUGING EQUIPMENT

Lars Ö. Forsman, Rorogatan18, S-253 72 Helsingborg, Sweden

Continuation of Ser. No. 743,858, Nov. 22, 1976, abandoned.
This application May 16, 1978, Ser. No. 906,644
Claims priority, application Sweden, Nov. 21, 1975, 7513098
Int. Cl.[2] G01B *5/00*
U.S. Cl. 33—169 R **5 Claims**



1. An apparatus for transmitting measuring motion, comprising:

two bar elements;

at least one of said bar elements including two rails, each of said rails having wall means defining a channel therein, said channels facing one another;

spacing means between said rails for maintaining said channels at a predetermined position with respect to each other;

means for clamping said two rails to one another with said spacing means therebetween;

one of said bar elements having at least one planar outside surface extending therealong;

means connecting said bar elements to one another in

spaced, substantially parallel relation; said connecting means permitting relative longitudinal movement of said bar elements;

abutment means limiting relative movement of said bar elements;

resilient means biasing the bar elements to an initial position relative to one another;

means for mounting the other of said bar elements to a support for supporting the apparatus thereon;

at least one measuring component;

and means for detachably mounting said measuring component against said planar outside surface of said one bar element in selected positions therealong determined by the object to be measured.

4,170,069

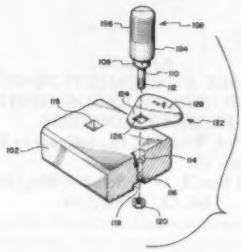
WHEEL LUG NUT TOOL

Michael Katsanevas, 1060 Fallbrook Way, Sandy, Utah 84070

Filed Feb. 27, 1978, Ser. No. 881,275

Int. Cl.[2] G01B *3/48*

U.S. Cl. 33—199 R **4 Claims**



1. A wheel lug nut tool for threaded fasteners comprising:

a base fabricated as a geometric shape and configurated as a receiver for releasably securing a plurality of lug studs to the base and including a plurality of uniform, geometric recesses with a coaxial throughbore of smaller diameter extending through the base;

a plurality of threaded lug studs adapted to be releasably mounted to the base, the lug studs representing different types of lug studs, the lug studs each configurated with a geometric boss at one end thereof, the geometric boss having a smaller cross section than the lug stud and dimensionally corresponding to the geometric recess to thereby accommodate being received therein in a nonrotatable engagement, the geometric boss having a threaded bolt extending coaxially therefrom to pass through the coaxial throughbore in the base to accommodate receipt of a nut to thereby releasably secure the lug stud to the base; and

indicia associated with each of the lug studs to indicate the size and thread type of each of said lug studs, said indicia being configurated as a tab which accommodates being releasably secured to the base upon securement of the lug stud to the base.

4,170,070

METHOD AND DEVICE FOR CONTROLLING THE GEOMETRY OF TWO-WHEELED VEHICLES

René Duchêne, 4, rue Monge, 92800 Puteaux, France

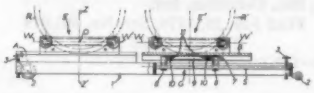
Filed Aug. 25, 1978, Ser. No. 936,685

Claims priority, application France, Aug. 30, 1977, 77 26283

Int. Cl.[2] G01B *5/255*

U.S. Cl. 33—203.18 **11 Claims**

1. A universal device for controlling the basic geometry of two-wheeled vehicles, comprising a substantially horizontal elongated base frame, a first pair of movable jaws disposed in the vicinity of one end of said base frame and located symmetrically on either side of a fixed vertical plane containing the longitudinal center line of said base frame, a first control device capable of moving simultaneously and to the same extent the two jaws of said first pair of mutually opposed directions perpendicular to said fixed vertical plane, a support mounted on said base frame near the opposite end thereof and movable in a direction perpendicular to said fixed vertical plane between a position aligned with the longitudinal axis of the base frame and end positions spaced transversely from said aligned position, a second pair of movable jaws carried by said support, the jaws of said second pair being disposed symmetrically on either side of another vertical plane fixed in relation to said support and coincident with said fixed vertical plane when said support is in its aligned position, a second control device capable of moving simultaneously and to the same extent the two



jaws of said second pair in mutually opposed directions perpendicular to said other vertical plane, one of said first and second pair of jaws being also movable in relation to said base frame in a direction parallel to the longitudinal axis of said base frame, each one of said first and second pairs of jaws being shaped to clamp the opposite edges of the rim of one wheel of a two-wheeled vehicle to be controlled at at least two pairs of longitudinally spaced and mutually registering points, and a measuring assembly consisting of an index and of a graduated scale, of which one is carried by said support and the other by said base frame, for displaying the value of the transverse displacement between said fixed vertical plane and said other vertical plane, and consequently the transverse displacement between the two wheels of the vehicle to be controlled.

4,170,071

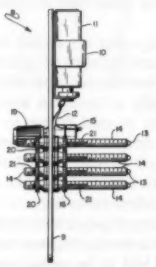
SIGHTING APPARATUS

Jerry Mann, 7400 Africa Rd., Westerville, Ohio 43081, and Theodore Schultz, 11360 Highland Park, Logan, Ohio 43138

Filed Jan. 26, 1978, Ser. No. 872,608

Int. Cl.[2] F41G *1/00*

U.S. Cl. 33—265 **8 Claims**



1. A sighting device for use in combination with an archery bow, comprising:

a. a base plate,

b. a source of energy mounted on said base plate,

c. means for varying the amount of energy from said energy obtained from said energy source, said means being manually operable,

d. manually operable switch means electrically connecting said source of energy to said means for varying the amount of energy obtained from said source of energy,

e. at least one light emitting diode electrically connected to said means for varying the amount of energy available

from said source of energy and also electrically connected to said source of energy,

f. at least one sighting pin mounted on said base plate, said at least one light emitting diode being mounted in and protruding beyond the end of said at least one sighting pin and circumferentially exposed to ambient light.

g. means for vertically and horizontally manually adjusting said at least one sighting pin, and

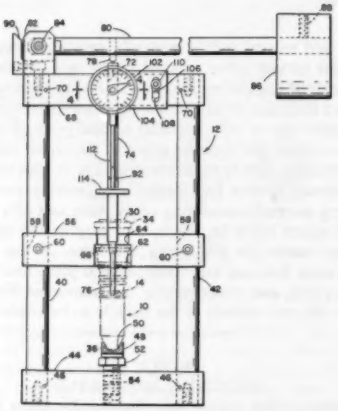
h. means for mounting said sighting device on an archery bow.

4,170,072

FUEL INJECTOR ADJUSTMENT FIXTURE

Ronald Downs, Seymour, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Feb. 25, 1976, Ser. No. 661,079
Int. Cl.[2] G01B *3/22*
U.S. Cl. 33—172 R **2 Claims**



1. Apparatus for permitting the adjustment of a stop for a displaceable plunger of a fuel injector having an elongated housing, said plunger being displaceable parallel to the longitudinal axis thereof, said housing having a tip at one end and a shoulder adjacent the other end thereof, said apparatus comprising:

a frame comprising a pair of parallel rails and a first cross bar extending between the ends of said rails, said first cross bar having a bore therethrough parallel to said rails,

means for releasably securing an injector in said frame;

a rod displaceable in said frame in a direction generally parallel to the direction of displacement of said injector plunger, one end of said rod abutting said plunger for displacement thereof and the other end extending through the bore in said first cross bar;

a spring loaded detent positioned in said first cross bar and engagable with a corresponding recess in said rod thereby permitting said rod to be maintained in an elevated position for installation of said injector;

an arm having one end pivotally mounted to said frame and a predetermined weight positioned at the opposite end of said arm, said arm abutting the opposite end of said rod at a point adjacent the pivot mounting to produce a force multiplication on said rod in response to movement of the opposite end of said rod;

a stop positioned on said first cross bar adjacent the pivotal mounting for said arm thereby permitting said arm to be swung out of contact with said rod when it is maintained in its upper position;

a flange positioned on said rod; and,

a linear displacement indicating device positioned on said first cross bar and having a displacement sensing rod in contact with said flange for indicating the displacement thereof;

said releasable securing means comprising a pair of cross bars extending between said parallel rails generally at right angles to the axis of an injector to be tested, one of said bars being displaceable relative to the other and having two intersecting semicircular through bores of different diameters formed therein, said bores thereby defining a shoulder at the point where they intersect for receiving the shoulder on said injector housing and a cup receiving the tip of said injector housing, said cup being threadedly engaged with the other cross bar for clamping the opposite ends of said injector housing independent of the displacement of said rod with a predetermined preload simulating the preload of the injector installed in an engine,

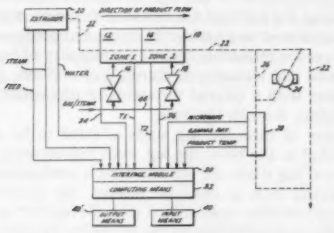
whereby said rod is actuated to displace said plunger to a given position permitting adjustment of said injector stop and said weight insures repeatable adjustment of said stop.

4,170,073

WIDE DYNAMIC RANGE MULTI-ZONE DRYING METHOD AND APPARATUS FOR CONTROLLING PRODUCT MOISTURE

Steven A. Ignatowicz, Wheeling, Ill., assignor to Kay-Ray, Inc., Arlington Heights, Ill.

Filed Dec. 1, 1977, Ser. No. 856,239
Int. Cl.[2] F26B *3/04*
U.S. Cl. 34—31 **23 Claims**



1. Apparatus for drying a product to a controlled moisture content comprising:

(a) a first drying zone for receiving said product,

(b) first regulating means for regulating the temperature within said first zone,

(c) a second drying zone for receiving said product from said first zone,

(d) second regulating means for regulating the temperature within said second zone,

(e) means for measuring the moisture in said product after said product leaves said second drying zone,

(f) means for measuring the temperature in said first and second zones,

(g) means for controlling said second regulating means in response to said measured product moisture and measured temperature of said second zone, and

(h) means for cooperatively controling said first regulating means in response to said measured product moisture and the measured temperature of said first zone,

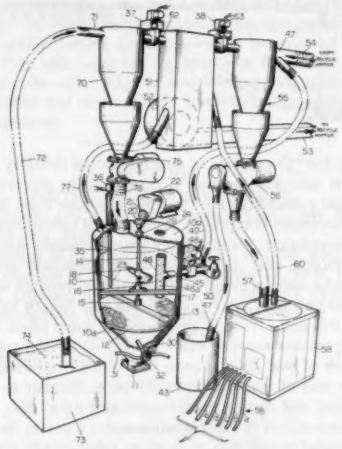
wherein said product enters said first drying zone from a product extruder and said means for controlling said first regulating means further comprises means responsive to said extruder product feed rate for applying an additional control of said first regulating means.

4,170,074

POWDER DRYER INCLUDING FLUIDIZED BED ASPIRATOR

Russell W. Heckman, Perrysburg, and George A. Nickey, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, OhioIO

Continuation of Ser. No. 747,586, Dec. 6, 1976, abandoned. This application Jul. 12, 1978, Ser. No. 923,868
Int. Cl.[2] F26B *17/10, 17/18*
U.S. Cl. 34—57 A 1 Claim



1. In an apparatus for suspending and drying powder in the form of a fluidized bed, said apparatus comprising an upright tubular chamber having an inlet for fluidizing gas positioned near the bottom, a porous, gas permeable membrane positioned within said chamber above said fluidizing gas inlet for distributing fluidizing gas and retaining powder, an outlet for fluidizing gas positioned near the top of said chamber, an inlet for powder, and an outlet for removing powder by aspiration, the improvement wherein said outlet for said powder is in the form of a duct extending into said chamber axially of said chamber, said duct having a first opening adapted to be above the level to be occupied by the fluidized bed and a second opening adapted to be below the level to be occupied by the fluidized bed, and a laterally extending aspirating conduit communicating with said duct intermediate said first and second openings, said chamber further including a rotatable impeller for mechanically agitating powder in said chamber, said impeller being positioned intermediate said porous membrane and said duct.

4,170,075

NOZZLE FOR WEB PROCESSING APPARATUS

John F. Scott, Oreland, Pa., assignor to Proctor & Schwartz, Inc., Philadelphia, Pa.

Filed Mar. 3, 1978, Ser. No. 883,296
Int. Cl.[2] F26B *13/00*
U.S. Cl. 34—160 2 Claims

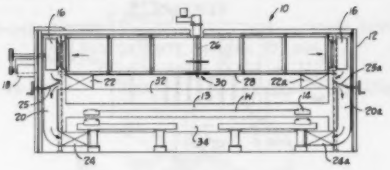
1. Apparatus for treating with gaseous medium materials conveyed therethrough in a conveying plane, comprising:

at least one pair of elongated ducts extending transverse to the direction of conveyance in said plane and positioned adjacent to one another;

means at opposite ends of said ducts to supply fluent medium to said ducts whereby the main direction of flow in one duct is opposite that in the other duct;

an elongated nozzle in each of said ducts adjacent the nozzle in the other duct extending across said plane and adapted to project an elongated common stream of fluent medium outwardly impinging against the material in said conveying plane along a line;

each of said nozzles comprising a pair of longitudinally extending converging surfaces positioned within the respective duct defining an elongated unobstructed narrowing passageway terminating in a continuous elongated



nozzle opening substantially flush with the outer surface of the duct;

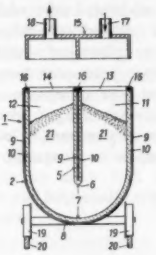
the elongated stream of gaseous medium flowing from one nozzle having a longitudinal current opposite to the longitudinal current of the gaseous medium stream flowing from the other nozzle thereby creating a swirling motion in said common stream along said line.

4,170,076

CONTAINER ARRANGEMENT FOR TREATING LUMPY AND GRAINED MATERIALS IN A PACKED BED WITH GASEOUS MEDIA

Paul Müllner, Traun, and Ernst Wildling, Linz, both of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Nov. 14, 1977, Ser. No. 850,923
Claims priority, application Austria, Dec. 1, 1976, 8880/76
Int. Cl.[2] F26B *17/00*
U.S. Cl. 34—217 8 Claims



1. In a container arrangement for treating lumpy and grained materials in the form of a packed bed with gaseous media and of the type including at least one container having an opening, and closing means provided to close said opening, the improvement which is characterized in that:

at least two adjacently arranged chambers are formed in said at least one container, each one of said at least two chambers having a bottom portion, walls and a top portion, the bottom portion of one of said at least two chambers communicating with the bottom portion of the respective other one of said at least two chambers and the materials to be treated being arranged as a packed bed of material in contact with said bottom portion and said walls of each one of said at least two chambers; and

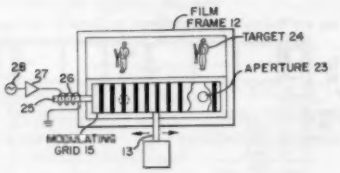
a supply conduit for the gaseous media is connected to the top portion of one of the at least two chambers and a drain conduit for the gaseous media is connected to the top portion of the respective other one of said at least two chambers so as to form a forced guidance for the gaseous media through the packed bed.

4,170,077

MOVING TARGET SCREEN WITH MODULATING GRID

Herman I. Pardes, 45 Wickapecko Dr., Wanamassa, N.J. 07712

Filed Jul. 12, 1978, Ser. No. 923,875
Int. Cl.[2] F41G 3/26
U.S. Cl. 35—25 10 Claims



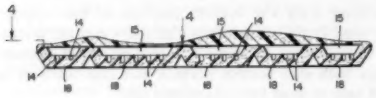
1. A system for enabling marksmanship practice comprising, in combination, a film frame projector and viewing screen, at least one apparatus simulating a weapon such as a rifle, an infrared detector mounted on said weapon, said projector having a projection lamp for providing energy including visible light and infrared light, said projector including optical means for directing the images of said film to provide a target scene on said screen at which said weapon may be aimed, each film frame including a target scene portion and a mask portion, a light aperture formed in said mask portion corresponding in position to a target on said scene portion, a light grid positioned adjacent the mask portion of said film to affect light passing through said mask portion, said grid having spaced substantially opaque sections, means for vibrating said grid to modulate light passing therethrough and through the apertures in said mask portion, said optical means including lens, a first mirror and a dichroic mirror, said dichroic mirror positioned in the path of the projected images and of the infrared light and positioned at an angle with respect to the plane of said lens for allowing visible light to pass therethrough onto said screen while reflecting the modulated infrared light, said first mirror positioned to receive infrared light reflected by said dichroic mirror and arranged to reflect said modulated infrared light to said screen to optically superimpose the aperture on said target and cause the infrared light to impinge on the target, and said screen reflecting said infrared light whereby the infrared detector on said weapon may respond to said modulated infrared light when said weapon is accurately aimed and simulates firing at said target.

4,170,078

CUSHIONED FOOT SOLE

Ronald Moss, 211 Stagg Walk, Brooklyn, N.Y. 11206

Filed Mar. 30, 1978, Ser. No. 891,504
Int. Cl.[2] A43B 13/18, 13/20
U.S. Cl. 36—28 5 Claims



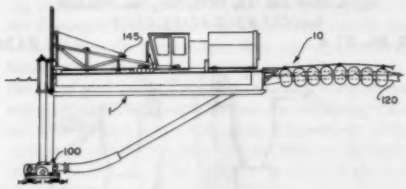
1. A cushioned foot sole comprising a top layer, a plurality of trapezoidal shaped segments depending at terminal and intermediate points therefrom, said segments having a hollow central portion and air pockets communicating therewith and formed therein.

4,170,079

DREDGE WITH ROTATABLE CUTTER DISCS

Malcolm L. Holekamp, 344 Gray Ave., St. Louis, Mo. 63119

Filed Nov. 8, 1976, Ser. No. 739,541
Int. Cl.[2] E02F 3/88
U.S. Cl. 37—65 3 Claims



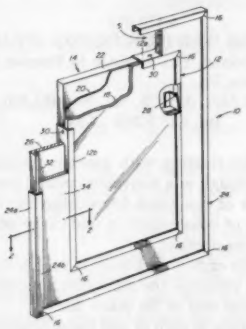
1. In a dredging device in which material freed by revolving cutters is pumped through a downwardly directed suction mouth and a discharge pipe to a place remote from the cutters, the improvement comprising a plurality of substantially continuous, imperforate, planar cutter discs mounted adjacent said suction mouth, said cutter discs being positioned substantially parallel to a suction mouth-defining frame, beneath said mouth and extending laterally from beneath said mouth beyond said mouth, said discs lying in generally the same plane and being spaced from one another and with respect to said open mouth; as to each of said discs, means for rotatably driving said disc about an axis of rotation generally perpendicular to the plane of said disc, and cutting teeth supported by said disc, said teeth being symmetrical in side elevation about a center line substantially parallel to said axis of rotation, substantially planar, thin, relative to their height and width and chamfered along sides which tend convergently from their lower edge to their upper edge, said teeth being mounted on arms pivotally mounted on said disc on axes perpendicular to said disc, said teeth extending in an axial direction beyond upper and lower surfaces of said disc, being oriented in a direction generally parallel to the axis of rotation of the disc and spaced radially outwardly from the periphery of said disc to permit swinging of said teeth, stops on a broad surface of the disc, the swing of said tooth arms being limited by the engagement of said arms and stops to a limited arc to either side of a radius of said disc, and means for reversing the direction of rotation of said disc.

4,170,080

EXPANDED COMPOSITE PICTURE FRAME

George G. Bergh, and Robert G. Bergh, both of Plainville, Mass., assignors to Bergh Bros. Co., Inc., Attleboro, Mass.

Filed Mar. 9, 1978, Ser. No. 884,833
Int. Cl.[2] G09F 1/12
U.S. Cl. 40—152 7 Claims



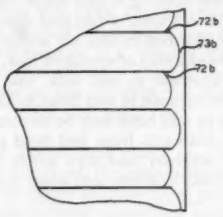
1. An expanded composite picture frame comprising: an

inner first frame component surrounding a display opening, said first frame component having a channel-shaped cross-section formed by a first side wall with parallel first flanges extending inwardly therefrom; means cooperating with said first frame component to retain a picture in said display opening; an outer second frame component surrounding said first frame component, said second frame component having a channel-shaped cross-section formed by a second side wall with parallel second flanges extending inwardly therefrom, the relative sizes of said first and second frame components being such that there exists a marginal space therebetween; and planar intermediate means for filling said marginal space, the inner edge of said intermediate means having inwardly protruding locking ears, said first side wall having apertures for receiving said locking ears, the outer edge of said intermediate means being firmly gripped and decoratively overlapped by said second frame component.

4,170,081
NOVEL MICROFILM JACKET

Paul A. Kiejzik, c/o Motion Technology Corp., Mt. Pleasant Dr., Aston, Pa. 19104

Continuation of Ser. No. 611,004, Sep. 8, 1975, Pat. No. 4,003,187, Division of Ser. No. 845,482, May 13, 1976, Pat. No. 4,123,891, Division of Ser. No. 845,483, May 13, 1976. This application Feb. 14, 1978, Ser. No. 877,576
Int. Cl.[2] G09F *1/10*
U.S. Cl. 40—159 **4 Claims**

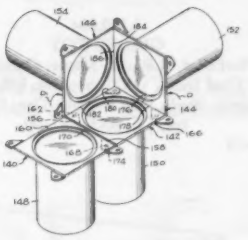


1. A microfilm jacket utilizable for machine insertion of a microfilm strip at one end into and through a through-passage, storage, and machine removal from a far open end, comprising in combination: upper and lower elongated sheets joined at spaced apart lines forming a plurality of storage channels parallel to each other, each said storage channel extending along a longitudinal axis of the sheets and having an outlet open-end to said storage channel formed at a point between the upper and lower elongated sheets at a distal outlet end of said storage channel, and each storage channel having a normally-closed insert-opening arced slit formed by slit structure in the upper elongated sheet, with the normally closed insert-opening arced slit extending transversely to said longitudinal axis, the slit structure consisting of: (a) first section of the upper elongated sheet having an upper convex lip and (b) a second section of the upper elongated sheet having a lower concave lip in opposing relationship to the upper convex lip, the normally-closed insert-opening arced slit being at an opposite proximate end of said upper elongated sheet, the upper convex lip extending towards the proximate end; each upper convex lip along with its respective lower concave lip, storage channel, and outlet open-end jointly forming a through-passage conduit, each through-passage conduit having a normally-closed insert-opening arced slit adapted to form an insertion open-space to the through-passage conduit when the second portion at the lower concave lip is pressed downwardly sufficiently to form an angle with the first section at the upper convex lip whereby a microfilm strip is insertable through each insertion open-space into its respective storage channel and through its respective through-passage conduit, each normally-closed insert-opening arced slit extending between and up-to its respective spaced-apart lines, the ends of each insert-opening arced slit being staggered relative to the ends of the arced slits which lie in adjacent through-passage conduits so that the promulgation of tear lines caused by alignment of said ends will be retarded or prevented.

4,170,082
MODULAR CONNECTORS FOR CYLINDRICAL ELEMENTS

Calvin Freedman, 4719 Vanalden Ave., Tarzana, Calif. 91356

Filed Feb. 28, 1977, Ser. No. 772,836
Int. Cl.[2] A63H *33/10*
U.S. Cl. 46—29 **15 Claims**



1. A connector for use in a construction embodying a plurality of tubular elements fastened together by means of a plurality of such connectors, said connector comprising:

a substantially planar base plate having a peripheral polygonal edge defining a plurality of adjoining sides;

a single attachment member hingedly mounted to, and extending laterally outwardly of certain of said sides, adjacent the corresponding end of each of said certain sides, said attachment member comprising a substantially planar tab having an aperture therein;

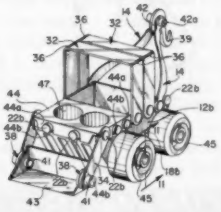
connecting means formed on said base plate adjacent the opposite ends of said certain sides, for releasably engaging corresponding attachment members on adjacent ones of said connectors, said connecting means comprising upstanding pins formed on at least one face of said plate in registry with the apertures in said corresponding tabs on adjacent connectors, for insertion into said apertures in releasable frictional engagement therewith; and

a resilient upstanding flange on at least one face of said plate, said flange having an inner wall conforming to and adapted to receive and frictionally retain the end of one of said tubular elements.

4,170,083
TOY CONSTRUCTION

Israel R. Freelander, 6 Spring Valley Dr., Worcester, Mass. 01609, and Jerrold J. Krumholz, East Orange, N.J., assignors to I. Robert Freelander

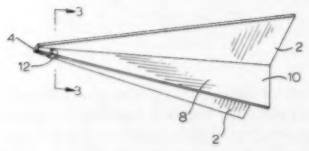
Filed Oct. 7, 1977, Ser. No. 840,236
Int. Cl.[2] A63H *33/10*
U.S. Cl. 46—29 **7 Claims**



1. A toy construction set, comprising a base unit having at least one generally flat planar surface to which flat side walls

are joined in perpendicular relation with respect thereto, a plurality of outwardly extending projections of circular cross section disposed in spaced apart relation on at least a pair of said side walls that are located in opposed, parallel and spaced relation, and a plurality of elongated, substantially flat, generally thin flexible straps, each of said flexible straps having opposed terminal ends in each of which an opening is formed, the diameter of which generally corresponds to that of said projections, the ends of each strap being connectable with a projection by the force fitting of the opening therein over the exposed projection, wherein said straps are mounted in frictional engagement on said projections and span at least a portion of said base unit in overlying relation thereto.

4,170,084
GLIDER TOY
Douglas E. Fierheller, R.R. #1, Maple, Ontario, Canada
Filed Dec. 8, 1977, Ser. No. 858,614
Claims priority, application Canada, Dec. 17, 1976, 268089
Int. Cl.[2] A63H *27/00*
U.S. Cl. 46—79 **2 Claims**



1. A method of forming a glider toy comprising the steps of:
extruding a long length of plastic in the shape of an "I-beam";
cutting said extrusion into desired lengths;
cutting said lengths diagonally along the web of said "I-beam" extrusion to form two triangular body portions;
trimming the flanges of said lengths to form triangular wing portions pointed in the same direction as the body portion.

4,170,085
DOLL WITH GROWING HAIR
Patrick Luke, Kowloon, Hong Kong, assignor to Mego Corp., New York, N.Y.
Filed May 23, 1977, Ser. No. 799,684
Int. Cl.[2] A63H *3/44*
U.S. Cl. 46—135 R **15 Claims**

1. A doll having a lock of hair of adjustable length and an adjustable torso which comprises a hollow head having an upper opening, a hollow upper torso, and a hollow lower torso, foraminous means rotatably connecting said head to the upper end of said upper torso, so that a first passage is provided between said head and said upper torso, the lower end of said upper torso being provided with a first inner flange, said first inner flange extending inwards from the lower periphery of said upper torso and terminating with an inner periphery defining a first opening, the upper end of said lower torso being provided with a second inner flange contiguous with said first inner flange, so that the upper and lower torsos are slidably engaged and may be rotated relative to each other, said second inner flange extending inwards from the upper periphery of said lower torso and terminating with a circular inner perimeter defining a second opening, said second opening being circular and having a diameter less than and being substantially coaxial with said first opening so that said first and second openings define a second passage, a cylindrical cord retention tube separate from said upper and lower torsos, said tube being disposed in and extending upwards from said second passage, being contiguous with the inner perimeter of said second flange, and having a third flange at the lower end of said tube, said third flange extending outwards from the lower end of said tube below said second flange and being contiguous with said second flange, said tube being provided with a pair of opposed circular openings, said opposed circular openings being coaxial and above and substantially tangential to the upper surface of said first flange, said upper torso being provided with a lower peripheral opening adjacent to said first flange, a cylindrical rod, said rod extending through the opposed openings in said tube and terminating at the lower peripheral opening in said upper torso, means extendable through the lower peripheral opening in said upper torso and into said doll to rotate said rod, a cord within said upper torso, one end of said cord being attached to said rod within said tube, and a lock consisting of a plurality of strands of hair, the other end of said cord being attached to said lock, said lock extending through said upper opening in said head, so that the length of said lock external to said head may be increased by manually pulling said lock outwards from said head or decreased by rotating said rod whereby said cord winds on said rod and pulls a portion of said lock into said upper torso.

4,170,086
STUFFED TOY ANIMAL
Isaac Hills, 18 Talley Rd., Roslyn, N.Y. 11576
Filed Mar. 20, 1978, Ser. No. 890,641
Int. Cl.[2] A63H *03/02*
U.S. Cl. 46—158 **15 Claims**

1. A stuffed toy animal including a head member with a face and two ears, a body member and four limbs with terminal members, the stuffed toy animal comprising:
an outer covering defining a closed receptacle having the shape of the stuffed toy animal when filled, the outer covering comprised of a patchquilt including at least one piece of a laminated fabric joined together with at least one piece of a fabric backed pile fiber material, the lami-

nated fabric piece defining a portion of one of the members and simulating humanoid features thereon, the pile fiber material providing a fur-like appearance, the laminated fabric including first and third layers comprised of a limp knitted fabric and a second self-form-maintaining semi-resilient layer situated between the first and third layers and joined thereto, the second layer comprised of a porous, flexible and resilient material having a modulus of elasticity sufficient to stiffen the first and third limp layers and impart a planar memory to the laminated fabric so that it lays substantially flat in an uncurled and immobile state when lying unstressed upon a flat substrate, the outer surface topography of the laminated fabric when incorporated in the animal having an even consistency essentially free from lumps or wrinkles, and

stuffing material beneath the outer covering filling the closed receptacle and in contact with the inner surface of the outer covering, the stuffing material assuming the shape of the closed receptacle, the outer surface of the stuffing material pressing against the inner surface of the outer covering giving the stuffed toy animal consistency and giving the portions of the stuffed toy animal covered by the laminated fabric a fleshy and plump appearance, the laminated fabric assimilating any irregularities in the outer surface topography of the stuffing material so that the outer surface topography of the laminated fabric in the animal maintains its consistency.

4,170,087

METHOD FOR GROWING PLANTS OR CROPS UTILIZING POLYOLEFIN COVERING MATERIAL

Graciano J. Tapia, Madrid, Spain, assignor to Alcudia, Empresa Para la Industria Quimica, S.A., Madrid, Spain

Division of Ser. No. 887,939, Mar. 17, 1978, Pat. No. 4,134,875. This application Aug. 22, 1978, Ser. No. 937,453
Int. Cl.[2] A01G *7/00*
U.S. Cl. 47—29 **11 Claims**

1. In a method for growing plants or crops wherein the greenhouse effect is utilized, the improvement comprising the step of covering the plants or crops being grown with a polyolefin film or sheet material comprising from about 80% or more polyolefin and from about 1% to about 15% by weight of an additive referred to as a basic metallic sulfate and having the formula

$$(SO_4)_4M_6^{III}.M_2^{I}12(OH)$$

wherein

M^{I} is a monovalent,

M^{III} is a trivalent metal,

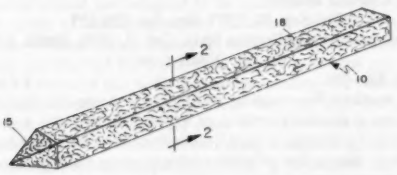
said film having low thermal transmittance properties between 7 and 14 micron wavelengths and excellent light diffusion properties.

4,170,088

PLANT SUPPORT STAKE

Brian E. Fritz, 1159 Hymettus, Leucadia, Calif. 92024, and Emil Pipersky, Chino, Calif., assignors to Brian E. Fritz, Leucadia, Calif.

Filed May 22, 1975, Ser. No. 579,823
Int. Cl.[2] A01G *27/00*
U.S. Cl. 47—47 **5 Claims**



1. A plant support stake for supporting climbing plants comprising:

an elongated stake body for being received in soil and for supporting a plant vertically above said soil,

said stake body having a core consisting entirely of a unitary foamed resilient plastic,

said resilient foamed plastic core having a cellular structure,

a fastener comprising two pointed members interconnected by a strap bridging said pointed members, said fastener for being received in, supported from, and retained by said foamed plastic core, and adapted for securing the plant to said stake body,

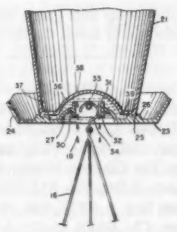
fibrous material comprising peat moss secured by adhesive over said stake body in a uniform thickness.

4,170,089

HANGING FLOWER POT

Thomas J. Smrt, 172 S. Northwest Highway, Cary, Ill. 60013

Filed Aug. 22, 1977, Ser. No. 826,938
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—67 **9 Claims**



1. A flower pot having a side wall, an open top, a bottom wall, a drip tube extending through the bottom wall and having a lower edge positioned below the portion of the bottom wall surrounding the drip tube whereby water flowing from the pot through the drip tube will drip downwardly from the lower edge of the drip tube, and a rod extending across the drip tube for supporting a second flower pot below the drip tube of the first flower pot.

4,170,090

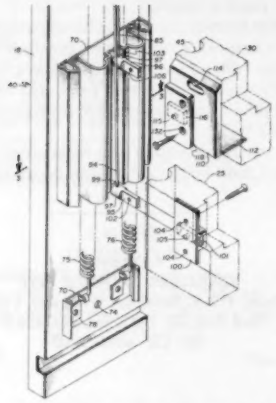
WEATHER STRIP AND BALANCE ASSEMBLIES FOR WINDOWS

Edward H. Wood, Sanford, N.C., assignor to Jim Walter Corporation, Tampa, Fla.

Filed Jun. 22, 1978, Ser. No. 917,926
Int. Cl.[2] E05D *15/22*
U.S. Cl. 49—176 **19 Claims**

1. A weather strip and balance assembly for a tilt-out sash window having a window frame including jambs and at least one sash having side stiles sliding in the side jambs of the window frame comprising: a jamb liner adapted to be positioned between the side stiles of the sash and the window frame jambs; each jamb liner being a weather strip having a ribbed surface adapted to slidably mount and seal to the side stiles of the sash and with a recessed surface adjacent the same, a mounting plate positioned behind and locked to the weather strip to permit flexing of the weather strip relative to the jambs of the window frame; a balance assembly positioned within each jamb liner, said balance assembly including a balance spring with a sash cord coupled thereto and directed over pulleys to apply tension of the balance spring to the sash, anchor means positioned within each jamb liner at the ends of the same and mounting one end of the spring and one of the pulleys to the jamb liner; and means adapted to be connected to

the ends of the sash to connect the sash cord to the sash, said last named means being pins adapted to ride in the recessed



surface of the weather strip and guide and retain the sash on the weather strip when it is tilted on the weather strip.

4,170,091

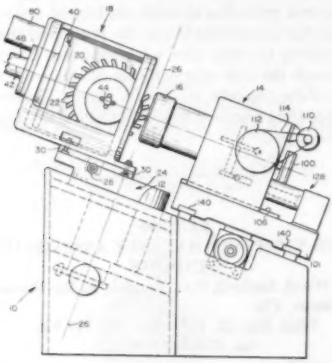
APPARATUS FOR RESHARPENING CUTTING BLADES FOR GEAR CUTTING MACHINE

Charles G. Ellwanger, and Harry Pedersen, both of Rochester, N.Y., assignors to The Gleason Works, Rochester, N.Y.

Continuation-in-part of Ser. No. 812,197, Jul. 5, 1977. This application Sep. 6, 1977, Ser. No. 831,013

Int. Cl.[2] B24B *53/02, 3/34*

U.S. Cl. 51—5 D **22 Claims**



1. A machine for high speed, production grinding of critical surfaces on cutting blades of a type designed for use in precision cutting operations, such as in gear cutting operations, comprising

a base structure having an inclined upper surface for supporting essential components of the machine,

a grinding wheel assembly mounted at a lower level end of the inclined upper surface of the base structure for supporting a grinding wheel having a grinding face directed toward an upper end of the base structure,

a cradle assembly mounted at an upper level end of the inclined upper surface of the base structure for supporting and positioning a plurality of cutting blades relative to the grinding face of said grinding wheel,

a tool-holding means for securing said plurality of cutting blades in serial positions which permit orientation of a common selected surface on all of the cutting blades toward said grinding face of said grinding wheel, said tool-holding means being mounted in said cradle assembly for being turned over in a cradle axis to thereby turn over all of said plurality of blades in their relative orientation to said grinding wheel, and

control means for relatively moving said grinding wheel assembly and said cradle assembly to thereby advance selected surfaces of said cutting blades into the grinding plane of said grinding wheel.

4,170,092

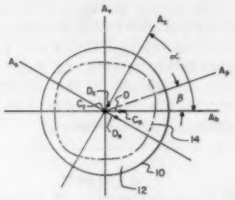
SINGLE-POINT BLOCKING METHOD OF SURFACING AND EDGING SPECTACLE LENSES

Gordon H. Keane, Jr., Portland, Oreg., assignor to Computer Management Services, Inc., Portland, Oreg.

Division of Ser. No. 646,486, Jan. 5, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,788

Int. Cl.[2] B24B *1/00*

U.S. Cl. 51—284 E **1 Claim**



1. A method of surfacing and edging a sphero-cylindrical spectacle lens requiring a decentration of the optical center of the lens a predetermined distance from the frame center thereof along a predetermined axis oblique to the cylinder axis of the sphero-cylindrical lens surface, said method comprising:

(a) attaching a lens-holding surfacing block to the outer surface of said lens such that said block is centered on the frame center of said lens;

(b) cutting the inner surface of said lens to a predetermined sphero-cylindrical shape by means of a cutting tool while holding said lens by said surfacing block relative to said cutting tool in a position tilted with respect to a position wherein the optical center of said lens, resulting from said cutting, would be coincident with the frame center thereof, such that the actual optical center is decentered from said frame center by said predetermined distance along said predetermined axis due to said tilting;

(c) attaching a lens-holding edging block to the outer surface of said lens such that said edging block is centered on said same frame center of said lens; and

(d) forming a peripheral edge of predetermined configuration around said lens while holding said lens by said edging block.

4,170,093

METHOD AND APPARATUS FOR ERECTING SUBSTANTIALLY DOME-LIKE BUILDING STRUCTURES

Mario Cappellini, Milan, and Dario Zucchi, Bologna, both of Italy, assignors to Binishells New Systems Limited, St. Peter Port, Channel Islands

Filed Sep. 30, 1977, Ser. No. 838,427

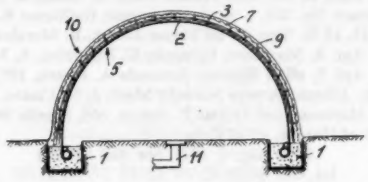
Claims priority, application Italy, Oct. 7, 1976, 28096 A/76

Int. Cl.[2] E04B *1/34*

U.S. Cl. 52—741 **1 Claim**

1. A method for erecting substantially dome-like building structures, comprising setting of a generally annular foundation work, anchoring, to said foundation work, of a membrane adapted to take, upon inflation with a gaseous fluid, a shape at least in part matching the structure to be erected, arranging of first elastically deformable reinforcing members over said membrane, still deflated, linking of said members to said foun-

dation work, spreading over said deflated membrane and said first reinforcing members of a first layer of concrete material having a thickness dimension such as to result in a first thin dome portion with respect to the final desired thickness of the dome, inflating of said membrane to the desired shape, laying, on the extrados of said first portion as soon as the latter has hardened substantially and while said membrane is still under tension, of second reinforcing members and of a second layer



of concrete material, so dimensioned as to result in a second dome portion of greater thickness than said first dome portion, and applying a means for making said second portion rigid with said first thin portion, wherein during the step of laying said second layer of concrete material and said second reinforcing members, framing edges are concurrently laid where openings have to be provided in the building structure, said second layer being arranged only outside of said framing edges.

4,170,094

CLOSURE FOR DOUBLE-WALLED WEBBED STRUCTURES

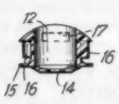
Herbert Helm, Darmstadt; Kurt Kundinger, Griesheim, and Karl-Heinz Schanz, Trasisa, Darmstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,528

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1977, 2708758

Int. Cl.² E04F *13/00*

U.S. Cl. 52—821 **2 Claims**



1. A closure closing the edge of a webbed panel structure including at least one pair of spaced parallely extending side walls and a plurality of webs extending therebetween defining a plurality of polygonal openings in the panel structure; said closure comprising a strip of flexible material whose width is substantially equal to the width of the panel edge to overlie and seal said edge, said strip having a plurality of hollow cylindrical projections formed thereon in a predetermined spaced relation along the length of the strip selected to permit insertion of said projections into at least some of said openings, said hollow projections having a first open end at the strip and an opposite closed end adapted to be inserted in said opening; at least some of said projections including integral peripheral annular flexible flange means formed on and surrounding the closed end thereof for frictionally engaging at least one of the inner surfaces of the walls and webs defining the openings in said panel structure and into which they are inserted to hold said strip on and against the edge of the webbed panel structure; each of said projections including a single longitudinal rib formed thereon and extending parallel to the central axis of the projections for guiding and positioning said projections in said openings; said ribs on adjacent projections being located on opposite sides of their respective associated projection.

4,170,095

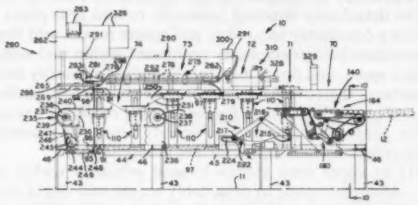
APPARATUS FOR HANDLING CONTAINERS AND THE LIKE OF VARYING DIMENSIONS

James R. Hightower, Sanger, Calif., assignor to S.W.F. Machinery, Inc., Sanger, Calif.

Filed Mar. 27, 1978, Ser. No. 890,078

Int. Cl.² B65B *57/02, 7/20*

U.S. Cl. 53—75 **21 Claims**



1. In a machine for performing a work operation on successive work objects during passage of corresponding portions of the work objects along a first path of travel, an apparatus for successively positioning the work objects in the machine with said portions thereof disposed in the first path of travel, the apparatus comprising a plurality of supports adapted to receive the work objects with said portions thereof spaced from their respective supports; means mounting said supports for movement from a position, spaced from the first path of travel sufficient to space said portions of the work objects received thereon from the first path of travel, along a second path of travel approaching the first path of travel; and means for individually detecting when said portions of the work objects are disposed in the first path of travel and thereupon terminating movement of their respective supports along the second path of travel.

4,170,096

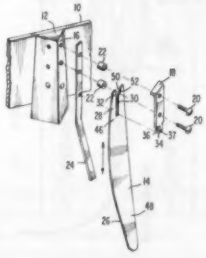
PACKER GRID BLOCK ASSEMBLY WITH DETACHABLE GUIDING FINGERS

Anton J. Wild, 310 Springfield Ave., Westfield, N.J. 07092

Filed Jul. 20, 1978, Ser. No. 926,583

Int. Cl.² B65B *39/02*

U.S. Cl. 53—248 **11 Claims**



1. A packer grid block assembly having detachable fingers for guiding articles into an orderly array to facilitate packing into receiving locations positioned therebelow which comprises:

(a) a plurality of approximately parallel and equally spaced grid plates;

(b) a plurality of support blocks secured to said grid plate at approximately equally spaced locations, said support blocks including two block surfaces at approximately 90° with respect to one another and at about 45° with respect to said grid plates, said support blocks defining article receiving passages between two adjacent block surfaces of

adjacent support blocks on a given grid plate and two adjacent block surfaces of adjacent support blocks on an adjacent grid plate;

(c) a plurality of cover plates each being fixedly secured to one of said block surfaces;

(d) securement means adapted to fixedly attach said cover plates to said block surfaces including spacer means fixedly positioned between said cover plates and said block surfaces to define a separation space therebetween;

(e) a plurality of elongated finger members of resilient material detachably attached indirectly to said grid plates by being detachably secured to said spacer means, said finger members being detachably positioned within said separation space, said finger members including upwardly facing surfaces thereof which cooperate with adjacent similarly configured fingers to define said article receiving passages for guiding articles into an orderly array for placement therebelow, said fingers further comprising:

(1) an upper neck section located primarily within said separation space to detachably secure said finger member in place, said upper neck section including a slot means extending from the top thereof longitudinally downward with respect to said finger member, said slot means including at least one enlarged area being adapted to detachably grip around one of said spacer means; and

(2) a lower section extending below said cover plate and inclined toward said article receiving passage to guide articles passing therethrough; and

(f) lateral movement restriction means located between said finger members and said spacer means and said cover plate to limit lateral movement of said finger members when detachably secured within said separation space.

4,170,097

APPARATUS FOR PACKAGING AN OBJECT

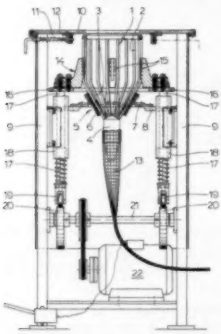
Wilhelmus F. W. Floet, Bloemendaal, and Hermanus N. Heijke, Zaandijk, both of Netherlands, assignors to Amtac B.V., Wormer, Netherlands

Filed Mar. 31, 1978, Ser. No. 892,013

Claims priority, application Netherlands, Apr. 7, 1977, 7703834

Int. Cl.[2] **B65B** *43/00, 67/02*

U.S. Cl. 53—567 **8 Claims**



1. An apparatus for packaging an object such as a root ball of a tree, shrub or plant, said apparatus comprising a socket which is supported in a substantially upright position and into which the object to be packaged is introduced, a stock of elastic reticulate hose material from which hoses are formed to surround the socket, a plurality of gripping elements arranged around the upright socket which are adapted to be moved upwards and downwards by a driving means, said gripping elements engaging the hose surrounding the socket during their upward stroke so as to move the hose upwardly along the socket but releasing the hose during their downward stroke, the upright socket being loosely carried by a support and being capable of a slight upward displacement with respect to the support, said upward displacement of the socket being limited by a stop.

4,170,098

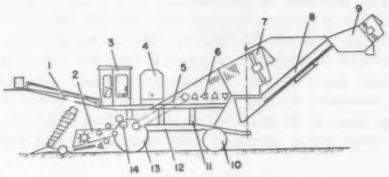
APPARATUS FOR HARVESTING SUGAR CANE

Miguel A. P. Moreno, Calle Juan Delgado 710, Vibora; Jorge A. Cil, Calle 19 No. 455, Vedado; Justo B. Montero, Calle San Mariano No. 265, c/armas y porvenir; Guillermo B. Novais, 18415, 15 St. Stgo. de las Vegas; Jose A. R. Morales, 309, O St., Apt. 8, Marianao; Fernando C. Montalvo, 6, Manrique St., Apt. 5, all of Havana; Armando A. Rivero, 189, 5a, St., Rpto. Alkazar, Arroyo Naranjo; Mario J. M. Castro, 2320, 80 St., Marianao, and Jacinto F. Suarez, 364, Manila St., Cerro, both of Havana, all of Cuba

Filed Aug. 2, 1977, Ser. No. 821,281

Int. Cl.[2] **A01D** *45/10, 55/18, 57/22, 45/02*

U.S. Cl. 56—13.9 **8 Claims**



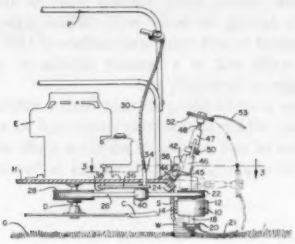
1. An improved apparatus for harvesting a vegetable mass, such as sugar cane, employing means for crosscutting and separating a vegetable mass and for unloading said mass from said apparatus, said apparatus having micro-relief surface contour copying wheels affixed thereto being freely rotatable upon contact with the ground, and said apparatus being further defined by means, in associated working relation therewith including: a frontal shoot stripper suspended from said apparatus chassis at its center; a harvesting section, pivotally mounted and suspended from said chassis; active dividers affixed to said apparatus for separating mass being conveyed on said apparatus, cutting means affixed to said apparatus for cutting lower stems of said vegetable mass, cross cutter means for cutting the stems of said mass; conveyor means for transporting the cut mass to a first cleaning chamber, said first chamber being formed of said apparatus with dispersing drums and blower means; an unloading conveyor with a pneumatic cleaning chamber to off load said mass after cleaning; wherein said improvement comprises; providing said apparatus with said crosscutting means including a crosscutting assembly attached to the chassis of said apparatus defined by two differently dimensioned rotatable drums having associated cutting blades respectively located off center with respect to the axis of rotation of said drums, and mounted in a non-tangential orientation thereto said pneumatic cleaning chamber is forward of said conveyor means formed with a battery of horizontal dispersing drums rotatable at different speeds, each having associated vanes disposed therein, said first cleaning chamber being further defined by a first axial extracting blower located at a specific angle of inclination with respect to the horizontal axis of said chamber; shutter means disposed in said chamber for drawing air therein to act upon said vegetable means being conveyed therethrough; countercutting elements disposed forward of said wheels for the hashing foreign matter of said vegetable mass and deflector means for directing said foreign matter away from the exit of the chamber; and second pneumatic cleaning chamber means formed on an unloading conveyor disposed beyond said first cleaning chamber employing a second axial extracting blower, located at an angle of inclination with respect to the horizontal axis of said second cleaning chamber, said second blowers being similar to said first blower.

4,170,099

POWER MOWER EDGER AND TRIMMER ATTACHMENT

Boyd L. Owens, P.O. Box 142, Cartersville, Okla. 74934

Filed Apr. 6, 1978, Ser. No. 894,061
Int. Cl.[2] A01D *53/14, 50/02*
U.S. Cl. 56—16.9 **4 Claims**



1. A grass edger and trimmer attachment for a power mower having a housing with a downwardly extending skirt and having an engine with a drive shaft extending into the housing and supporting cutter blades located within the skirt, comprising:

a bearing adapted to be mounted on but outside the housing and supporting a vertical trimmer shaft extending below the skirt;

a trimmer hub on the bottom portion of the trimmer shaft and supporting flail members operative for trimming grass adjacent to the skirt when the shaft and hub are rotated;

a first pulley on the drive shaft and a second pulley on the top portion of the trimmer shaft, the skirt having a slot therethrough located between the pulleys;

a drive belt extending through the slot and around the pulleys; and

an edger assembly including an arm supporting a bearing, the arm having an inner end adapted to be hinged hinged to the housing near the slot, and the arm supporting an edger shaft in the bearing which shaft extends beyond the outer end of the arm, and the edger assembly further including an edger hub with flail members attached thereto and mounted on the outer end of the edger shaft and a friction drive wheel mounted on the edger shaft, the arm being hinged to the housing in such a location that when the arm is pivoted to a position wherein the edger shaft is substantially horizontal the friction drive wheel rides on the top of the second pulley and drives the edger hub and flail members.

4,170,100

TREE SHAKER

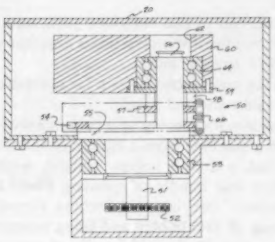
Clarence E. Hood, Jr., Clemson, S.C.; Yekutiel Alper, Rishon-Leziyyon, Israel, and Byron K. Webb, Clemson, S.C., assignors to Clemson University, Clemson, S.C.

Filed Sep. 19, 1977, Ser. No. 834,325
Int. Cl.[2] A01D *46/00*
U.S. Cl. 56—328 TS **6 Claims**

1. Tree shaking apparatus comprising:

(a) a frame, said frame comprising a pair of pivotally connected arms, each arm having a gripping element thereon, said arms being moveable about said pivotable connection to move said gripping elements into and out of gripping engagement;

(b) motion converter means operatively associated with the gripping element of each arm, said motion converter means comprising an input drive shaft, a portion of said shaft being eccentric to the axis of said drive shaft, a rotatable mass rotatably received around said eccentric shaft portion, a first sprocket secured to said rotary mass and received around said eccentric shaft portion, a second sprocket secured against rotation adjacent said first sprocket and a double chain connecting said sprockets, whereby rotation of said drive shaft causes said first sprocket to move in a direction counter thereto, following a path around said second sprocket; and



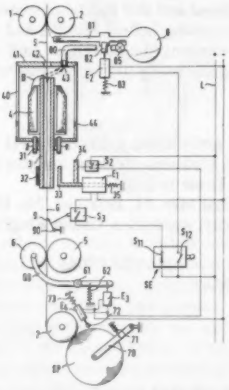
(c) power means located at the pivotal connection of said arms, said power means being operatively associated with the drive shafts of said motion converter means.

4,170,101

METHOD AND APPARATUS FOR PIECING AN ENTWINED YARN

Erich Bock, Ingolstadt, Fed. Rep. of Germany, assignor to Schubert and Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Nov. 15, 1978, Ser. No. 960,748
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2753349
Int. Cl.[2] B65H *81/08;* **D02G** *3/36;* **D01H** *15/00*
U.S. Cl. 57—6 **13 Claims**



1. A method of piecing up a broken entwined yarn being produced on a machine from a bundle of spinning fibers and a binding thread, a driven hollow spindle, a pair of delivery rollers feeding said bundle of spinning fibers to said hollow spindle, a bobbin carrying said binding thread, said binding thread running off said bobbin and being wrapped around said bundle of fibers, said bundle of spinning fibers with said binding thread wrapped therearound passing through said hollow spindle and being wound as entwined yarn on a second driven bobbin, said method comprising the following steps:

deflecting said bundle of spinning fibers continuing to emerge from said pair of delivery rollers from its normal path of travel between said delivery rollers and said hollow spindle with a stream of suction air responsive to breakage of said entwined yarn;

stopping the rotation of said hollow spindle and said second driven bobbin;

delivering an end of said entwined yarn from said second bobbin back through said hollow spindle to a point between said hollow spindle and said pair of delivery rollers and uniting with an end of said binding thread extending from said bobbin; starting the rotation of said hollow spindle;

twisting said end of said entwined yarn, said binding thread and said bundle of spinning fibers together with said rotating hollow spindle; and

again driving said second bobbin for continuing the production of said entwined yarn.

4. An apparatus for piecing up a broken entwined yarn being produced on a machine from a bundle of spinning fibers and a binding thread, a driven hollow spindle, a pair of delivery rollers feeding said bundle of spinning fibers to said hollow spindle, a bobbin carrying said binding thread, said binding thread running off said bobbin and being wrapped around said bundle of spinning fibers, said bundle of spinning fibers with said binding thread wrapped therearound passing through said hollow spindle and being wound as entwined yarn on a second driven bobbin, said apparatus comprising:

suction means for deflecting said bundle of spinning fibers continuing to emerge from said pair of delivery rollers after breakage of said entwined yarn from its normal path of travel between said delivery rollers and said hollow spindle;

means for stopping the rotation of said hollow spindle and said second driven bobbin;

means for delivering an end of said entwined yarn from said second bobbin back through said hollow spindle to a point between said hollow spindle and said pair of delivery rollers and uniting with an end of said binding thread extending from said bobbin;

means for restarting the rotation of said hollow spindle;

means for twisting said end of said entwined yarn, said binding thread and said bundle of spinning fibers together with said rotating hollow spindle; and

means for restarting the driving of said second bobbin for continuing the production of said entwined yarn.

4,170,102

OPEN END SPINNING ROTOR WITH SPECIAL BOSS

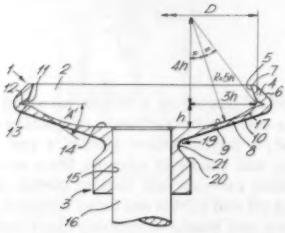
John Whiteley, Clitheroe, England, assignor to Platt Saco Lowell Limited, Great Britain

Filed Mar. 21, 1978, Ser. No. 888,820

Claims priority, application United Kingdom, Mar. 26, 1977, 12844/77

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.89 **10 Claims**



1. In a rotor for an open end spinning machine, including a cup portion having walls with a region of maximum diameter for the collection of fibers thereat and defining a cavity with an open top at one end for the removal of the collected fibers as yarn therefrom, a base portion at the other end of said cavity and a boss portion extending outwardly from said base portion, said boss being formed with a bore therethrough extending axially concentric with said boss, base and cup walls, wherein said bore is of such dimensions as to provide a strong interference fit of said boss portion with a supporting shaft when the latter is fitted therein, the improvement comprising:

the portion of said cup walls, which extends between said region of maximum diameter of said cup and said respective base and boss portions thereof, being defined between inner and outer wall surfaces each surface of which is devoid of abrupt angular changes in direction;

said boss portion being formed with an annular concave recess having an outer wall surface which is smoothly conjoined to said outer wall surface of said portion of said cup walls and in a manner devoid of abrupt angular changes in direction; and

said base portion being formed with a substantially planar surface which is smoothly conjoined to said inner wall surface of said portion of said cup walls and in a manner devoid of abrupt angular changes in direction.

4,170,103

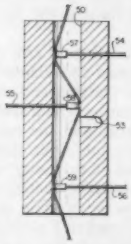
NODE FIXATION IN SELF-TWIST YARN

Alan H. Norris, and Phillip W. Chambley, both of Rome, Ga., assignors to WWG Industries, Inc., Rome, Ga.

Filed Mar. 29, 1978, Ser. No. 891,068

Int. Cl.[2] H01B *13/04;* D02G *3/26*

U.S. Cl. 57—293 **7 Claims**



1. A method of joining yarn strands at longitudinally spaced points in a continuous yarn production system of the type having means for forming and longitudinally moving a plurality of yarn strands, and reversible twisting means for imparting false twist to each of the longitudinally moving strands in alternating length segments of S and Z twist, the method including the steps of

engaging the yarn strands at a first point downstream of the twisting means to establish a twist trap point;

reversing the twist direction of said twisting means;

engaging the yarn strands at second and third points spaced upstream and downstream, respectively, of said first point and downstream of said twisting means, the spacings between the first point and the second and third points being chosen to include substantially equal numbers of turns of opposite twist between said first point and said second and third points respectively;

releasing the strands at said first point to permit the strands between said second and third points to untwist;

joining the strands together between said second and third points to form joined nodes of twist reversal; and

releasing the strands at the second and third points and permitting the strands to self-twist.

4,170,104

SWITCH MECHANISM FOR WRISTWATCH

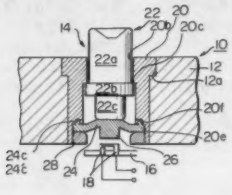
Hisao Yamagata, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Japan

Filed Nov. 30, 1977, Ser. No. 856,189

Claims priority, application Japan, Dec. 1, 1976, 51-159856[U]; Dec. 1, 1976, 51-159857[U]; Dec. 25, 1976, 51-175084[U]; Feb. 22, 1977, 52-18487

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 R **22 Claims**



1. A switch mechanism for a wristwatch having a case and a substrate mounted in the case, comprising:

conductive contact means disposed on said substrate to be in registration with a switch position of said switch mechanism;

stepped bore means provided in alignment with said contact means;

a diaphragm assembly including a flange, an embossed portion integral with said flange, and a contact element provided on a bottom wall of said embossed portion to be in alignment with said contact means;

pressure ring means for compressing said flange to retain said diaphragm assembly in place while providing a water-tight sealing effect; and

push-button means disposed in said stepped bore means and normally engaging the embossed portion of said diaphragm assembly, said push-button means being movable to press said embossed portion and said contact element toward said contact means to close said switch mechanism when said push-button means is depressed;

said diaphragm assembly including a radial distortion preventive means by which the flange of said diaphragm assembly is prevented from being distorted in a radial direction, said radial distortion preventive means comprising a plurality of engagement bore means formed in the flange of said diaphragm assembly, and said pressure ring comprising a plurality of engagement projections fitted to the engagement bores of the flange of said diaphragm assembly.

4,170,105

ELECTRONIC TIMEPIECE

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 13, 1977, Ser. No. 796,521

Claims priority, application Japan, May 14, 1976, 51-55176

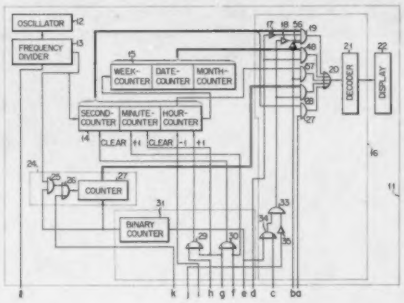
Int. Cl.[2] G04C *3/00, 9/00;* G04F *10/04*

U.S. Cl. 58—23 R **13 Claims**

1. An electronic timepiece including a reference oscillator generating reference clock signals, a time count circuit coupled to said reference oscillator for counting reference clock signals from said reference oscillator, a display device coupled to said time count circuit for displaying a count value of the time count circuit, and switch means comprising at least two independent, manually operable switches, the timepiece further comprising:

detecting means coupled to said switch means for detecting the simultaneous operation state of at least two switches of said switch means;

function setting means coupled to said detecting means for detecting that the simultaneous operation state detected by said detecting means is continued for a predetermined time and for designating a different function from a time count function responsive to said simultaneous operation state being continued for said predetermined time; and



function executing means coupled to said function setting means for performing the designated different function by operating at least one switch of said switch means.

4,170,106

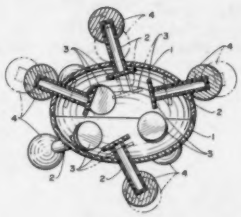
INFANT'S RATTLE

Roberta S. Koslosky, Rte. 1, Box 187, Mt. Shasta, Calif. 96067

Filed Oct. 4, 1977, Ser. No. 839,279

Int. Cl.[2] A63H *5/00*

U.S. Cl. 46—193 **6 Claims**



1. An infant rattle comprising a hollow hub having both a top and bottom half, said hub being elipsoidal in configuration and having a plurality of freely slideably mounted prongs radiating outwardly therefrom, the number of said prongs being evenly distributed between the top and bottom of said hub, wherein each of the top and bottom of said hub have four prongs projecting radially outward equidistantly spaced apart, and a fifth prong uniformly spaced apart from the other four prongs and disposed outwardly from said hub at a right angle to the horizontal axis of said hub.

4,170,107

METHOD AND APPARATUS FOR INTERCOOLING THE CHARGE AIR OF A PRESSURE-CHARGED INTERNAL COMBUSTION ENGINE

Hansulrich Hörler, Zürich, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Aug. 15, 1977, Ser. No. 824,794

Claims priority, application Switzerland, Oct. 15, 1976, 13081/76

Int. Cl.[2] F02C *3/02*

U.S. Cl. 60—39.45 **8 Claims**

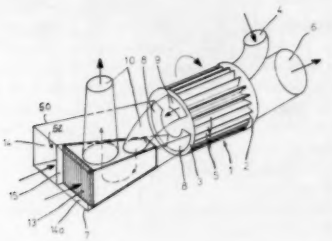
1. In a method for intercooling the charge air of a pressure-charged internal combustion engine by way of an air-cooled heat exchanger, wherein the internal combustion engine is

pressure-charged with a gas-dynamic pressure-wave machine, the improvement which comprises the steps of:

dividing the entire quantity of outside air drawn-in by the pressure-wave machine into a partial stream of scavenging air and a partial stream of charge air;

directing the scavenging air to flow as a coolant through the heat exchanger and upon leaving the latter directing said scavenging air through said pressure wave machine so as to perform its intended scavenging function in the pressure-wave process; and

compressing the charge air in the pressure-wave machine and intercooling the compressed charge air upon bearing the pressure-wave machine by passing such compressed charge air in the heat exchanger cooled by the scavenging air.



4,170,108

FUEL INJECTORS FOR GAS TURBINE ENGINES

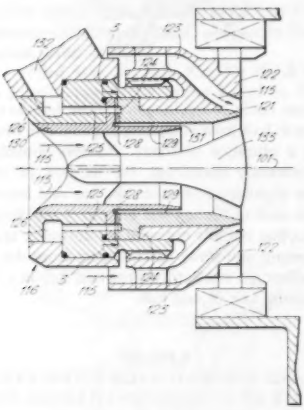
John A. Mobsby, Draycott, England, assignor to Rolls-Royce Limited, London, England

Continuation-in-part of Ser. No. 677,854, Apr. 16, 1976, abandoned. This application Nov. 8, 1977, Ser. No. 849,660

Claims priority, application United Kingdom, Apr. 25, 1975, 17356/75

Int. Cl.[2] **F02C** *7/22*

U.S. Cl. 60—39.74 R **9 Claims**



1. A fuel injector for a gas turbine engine comprising a hollow central body, an outer body which at least partly surrounds the central body and defines a flow passage therewith, said flow passage and the interior of the central body being adapted to receive a supply of compressed air, a plurality of orifices in the internal surface of said central body, each said orifice communicating with a flow duct in said central body, said flow duct being adapted to supply fuel to each of said orifices, an elongate annular member located adjacent said plurality of orifices so as to define an annular gap between it and said internal surface of said central body, which gap is adapted to receive a flow of fuel through said orifices, the minimum flow area of the gap being larger than the total flow area of said orifices so that the gap does not provide a flow controlling orifice for the fuel flow and the radial width of the gap having a value of 0.015 to 0.02 inches whereby it deforms the separate flows from said orifices into a substantially single annular flow of generally uniform thickness.

4,170,109

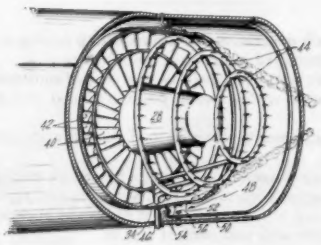
THRUST AUGMENTOR HAVING SWIRLED FLOWS FOR COMBUSTION STABILIZATION

William J. Egan, Jr., Lake Park; Kurt J. Hanloser, North Palm Beach, and James H. Shadowen, Riviera Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 9, 1977, Ser. No. 849,905

Int. Cl.[2] **F02K** *3/10, 3/06, 1/02*

U.S. Cl. 60—204 **10 Claims**



10. A method for augmenting the thrust of a turbofan, gas turbine engine comprising the steps of:

forming a core stream of working medium gases from the turbine section of the engine;

forming an annular bypass stream of working medium gases from the fan section of the engine around said core stream;

flowing a radially outward portion of said bypass stream through an annular pilot burner to produce an annular stream of hot, low density effluent circumscribing the remaining bypass stream and the core stream;

swirling said working medium gases of the remaining bypass stream and of the core stream circumferentially about the engine to centrifuge these gases radially outward into the hot, low density gases of the pilot burner effluent; and

discharging fuel into said swirling working medium gases such that a mixture of fuel and air is centrifuged into the hot, low density gases of the pilot burner effluent and is ignited thereby.

4,170,110

COMBUSTION PROCESS

Edward Radin, 901 Ave. H, Brooklyn, N.Y. 11230

Filed Jul. 19, 1976, Ser. No. 706,845

Int. Cl.[2] **F02K** *7/10*

U.S. Cl. 60—204 **8 Claims**

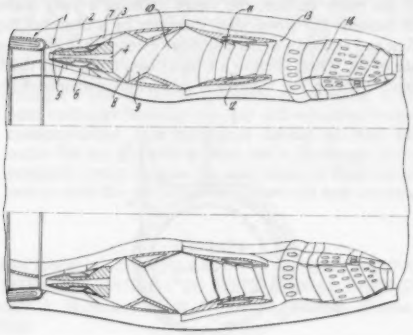
1. A method of supersonic combustion for operating an engine having a combustion chamber, a wedge therein with a porous surface for supporting and producing a stream of fuel, means for injecting fuel under pressure to said porous surface of the wedge, and at least one oblique plane surface within said combustion chamber arrayed in the path of said stream of fuel comprising the steps of:

a. forming at least one centripetally coalescent stream of fluid at supersonic velocity;

b. impinging said stream of fluid against said porous surface of said wedge;

c. injecting simultaneously with steps (a) and (b) fuel to said

porous surface of said wedge and thereby further forming a combustible admixture; and,

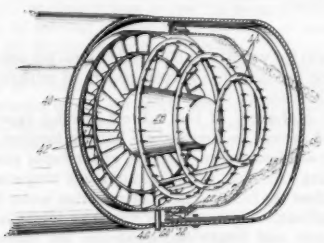


d. immediately thereafter auto-igniting the combustible admixture by flowing said admixture against said oblique plane at supersonic velocities.

4,170,111
THRUST AUGMENTOR

George D. Lewis, North Palm Beach, and James H. Shadowen, Riviera Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 9, 1977, Ser. No. 849,906
Int. Cl.[2] F02K *3/10, 3/06, 1/02*
U.S. Cl. 60—261 **10 Claims**



1. An augmentor structure of the type adapted for use with a gas turbine engine having a core stream and a bypass stream of relatively high density working medium gases wherein said augmentor includes:

an annular pilot burner circumscribing said bypass stream and adapted to produce during operation an annular stream of relatively low density working medium gases;

means for injecting fuel into said core and bypass stream; and

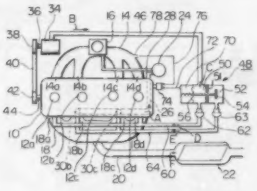
means for inducing swirl in said core and bypass streams such that the medium gases of the core and bypass streams are impelled radially outward into said medium gases emanating from the pilot burner;

wherein said annular pilot burner is of the premixing type.

4,170,112
INTERNAL COMBUSTION ENGINE OF CLEANED EXHAUST GAS

Hironori Bessho, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 6, 1977, Ser. No. 830,790
Claims priority, application Japan, Jul. 23, 1977, 52-087884
Int. Cl.[2] F01N *3/10;* **F02M** *23/08*
U.S. Cl. 60—278 **1 Claim**



1. An internal combustion engine comprising:

an engine body provided therein with a plurality of combustion chambers;

an intake system connected to each of the combustion chambers for introducing a combustible mixture into the chambers;

an exhaust system having branch passageways each of which on one end thereof is connected to a corresponding one of the combustion chambers for receiving resultant exhaust gas therefrom;

a catalytic converter disposed in the exhaust system downstream of the branch passageways for oxidizing unburnt components remaining in the exhaust gas;

an exhaust gas recirculating passageway means for recirculating exhaust gas from the exhaust system into the intake system, which exhaust gas recirculating passageway means is connected to at least one but not all of the branch passageways;

an air pump means operated by the engine;

a main air injection means for introducing, after the engine has fully warmed up, an appropriate amount of air from the air pump means into the exhaust system for maintaining an effective NO_x component decreasing effect produced by the exhaust gas recirculation operation;

a supplementary air injection means for introducing, when the engine is operating under a warming up condition during which the catalytic device is not fully activated, an excessive amount of secondary air directly into the branch passageways at positions located near the combustion chambers, said excessive amount of air operating to cause the catalytic converter to be quickly activated;

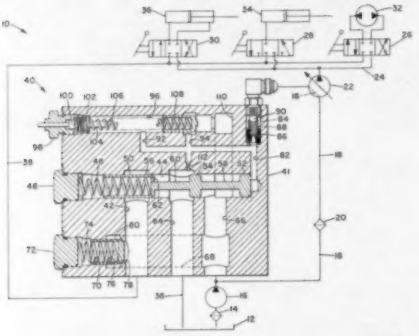
said main air injection means comprises a first air injection pipe means adapted for connecting the air pump means always with at least one branch passageway at a position located near a corresponding one of said combustion chambers, to which passageway the exhaust gas recirculating passageway means is not connected; and

said supplementary air injection means comprises: a second air injection pipe means connected, on one end thereof, to the branch passageways to which the exhaust gas recirculating passageway means is connected; an operating valve means located between the first air injection pipe means and the second air injection pipe means; and an actuator means for operating the operating valve means to cause the first air injection pipe means to communicate with the second air injection pipe means when the engine is operating under the warming-up condition.

4,170,113
HYDRAULIC SYSTEM WITH UNLOADING VALVE ASSEMBLY

Carl E. Kittle, and Richard A. Wittren, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 24, 1978, Ser. No. 889,650
Int. Cl.[2] F15B *11/16, 21/04*
U.S. Cl. 60—427 8 Claims



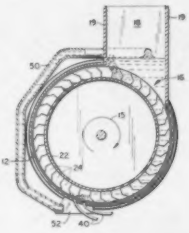
1. A hydraulic system comprising: A fluid reservoir; a charge pump having an inlet connected to the reservoir and an outlet for providing pressurized fluid; a charge passage connected to the outlet of the charge pump; a supply pump having an inlet connected to the charge passage and an outlet for providing high pressure fluid; a supply passage connected to the outlet of the supply pump; fluid function means having an inlet connected to the supply passage for using the high pressure fluid from the supply passage and having an outlet for exhausting low pressure fluid therefrom; a return passage connected to the outlet of the fluid function means; unloading valve means connected to the return passage, the reservoir, and the charge passage normally blocking the return passage and the charge passage from the reservoir responsive to a predetermined pressure level of pressurized fluid in the charge passage to connect the return passage to the reservoir; and makeup valve means connected between the return passage and the charge passage responsive to a predetermined pressure level of low pressure fluid in the return passage caused by the blocking of the return passage from the reservoir to connect the return passage to the charge passage whereby the unloading valve means connects the return passage to the reservoir when the predetermined pressure level of pressurized fluid in the charge passage is reached and the makeup valve means connects the return passage to the charge passage when the predetermined pressure level of low pressure fluid is reached.

4,170,114
RECIRCULATING SUBMERSIBLE TURBINE

Robert L. Pruett, Rte. 2, Box 69, Gardnerville, Nev. 89410

Filed Dec. 5, 1977, Ser. No. 857,635
Int. Cl.[2] F03B *13/10*
U.S. Cl. 60—496 6 Claims

1. In a turbine having a wheel with a plurality of chambers on its periphery, the wheel being submerged in liquid, wherein gas injected into the liquid below the wheel becomes entrapped in the chambers on one side of the wheel, imparting buoyant lift to those chambers and causing the wheel to rotate, an improved wheel and housing comprising: a cylindrical housing having an inner diameter and enclosing the wheel, the housing having an opening at the top thereof for the gas to escape; gas injection means near the bottom of the housing; a hollow cylindrical wheel shell having an outer surface defining a wheel shell outer diameter, the wheel shell having first and second open ends; means covering the first and second open ends, forming a hollow liquid-tight assembly, whereby the wheel is buoyed up by the liquid; a plurality of vanes extending outwardly from the outer surface of the hollow cylindrical wheel shell, each of the vanes having a flat portion perpendicular to the outer surface, the vanes defining a vane diameter which exceeds the wheel shell diameter by a chamber depth; and first and second annular members extending from the outer surface of the wheel shell to a wheel diameter at least the vane diameter wherein the vanes and said annular members define

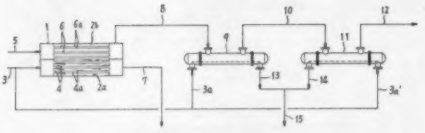


the chambers; the inner housing diameter and the vane diameter defining a clearance substantially less than the depth of the chambers, wherein the gas injected into the housing displaces liquid and wherein the vanes push water tangentially in a direction following the direction of rotation such that at least some displaced water circulates upward in the clearance region between the housing inner surface and the vane diameter.

4,170,115
APPARATUS AND PROCESS FOR VAPORIZING LIQUEFIED NATURAL GAS

Isami Ooka; Tomohiro Sato, and Kyohei Niwa, all of Osaka, Japan, assignors to Osaka Gas Company, Limited, Osaka, Japan

Filed Jul. 5, 1977, Ser. No. 813,095
Claims priority, application Japan, Jul. 5, 1976, 51-80259
Int. Cl.[2] F17C *7/02*
U.S. Cl. 62—52 10 Claims



1. Apparatus for vaporizing liquefied natural gas and heating the vaporized gas close to the temperature of estuarine water used as the heat source comprising:

(i) a heat exchanger of the indirect heating type having enclosed therein an intermediate heating medium divided into a lower liquid portion and an upper vapor portion for producing vaporized natural gas of a low temperature not higher than the freezing point of estuarine water from the liquefied natural gas, an inlet for introducing estuarine water into said lower liquid portion for indirect heat exchange with said intermediate heating medium, an outlet for discharging estuarine water from said lower liquid portion after said indirect heat exchange with said intermediate heating medium, said intermediate heating medium being heated to a vaporization temperature which is not higher than the freezing point of said estuarine water by said indirect heat exchange therewith in said lower liquid portion, the vaporized intermediate heating medium passing to said upper vapor portion, an inlet for introducing liquid natural gas into said upper vapor portion for indirect heat exchange with the vaporized intermediate heat exchange medium to vaporize said liquid natural gas, and an outlet for discharge of vaporized liquid natural gas,

(ii) a multitubular concurrent heat exchanger for heating the vaporized gas from the first heat exchanger by heat ex-

change between the gas and estuarine water, the concurrent heat exchanger having an inlet and an outlet for the gas and an inlet and a discharge outlet for estuarine water, and the gas inlet being in fluid communication with the gas outlet of the first heat exchanger, and

(iii) a multitubular countercurrent heat exchanger for heating the vaporized natural gas from the second heat exchanger close to the temperature of estuarine water by heat exchange between the gas and estuarine water, the countercurrent heat exchanger having an inlet and an outlet for the gas and an inlet and a discharge outlet for estuarine water, and the gas inlet being in fluid communication with the gas outlet of the second heat exchanger.

4,170,116

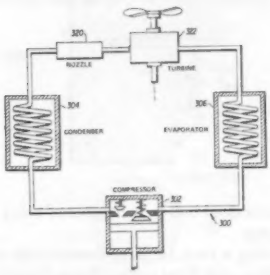
METHOD AND APPARATUS FOR CONVERTING THERMAL ENERGY TO MECHANICAL ENERGY

Kenneth A. Williams, 620 N. Gulf Blvd., Belleair Shores, Fla. 33535

Continuation-in-part of Ser. No. 684,074, May 7, 1976, Pat. No. 4,086,772, which is a continuation-in-part of Ser. No. 618,936, Oct. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 753,921, May 2, 1975, abandoned. This application Jan. 18, 1978, Ser. No. 869,631

Int. Cl.[2] F25B *13/00*

U.S. Cl. 62—116 **31 Claims**



1. In a method for achieving heating or refrigeration including the steps of compressing a refrigerant vapor stream, condensing said vapor, expanding said resulting fluid stream to reduce its saturation temperature and pressure, and passing said expanded fluid stream in heat exchange relationship with a source of thermal energy to re-vaporize at least a portion thereof, the improvement comprising:

expanding said fluid stream by passing it through at least one area of constricted flow while maintaining said flow in a substantially non-throttling condition to increase the kinetic energy thereof, and converting the kinetic energy of said resulting fluid stream to shaft work.

4,170,117

MIST SPRAY APPARATUS FOR AIR CONDITIONER CONDENSER

Robert L. Faxon, 708 N. Spring St., Pensacola, Fla. 32501

Filed Sep. 13, 1977, Ser. No. 832,923

Int. Cl.[2] F25B *39/04*; F28D *5/00*

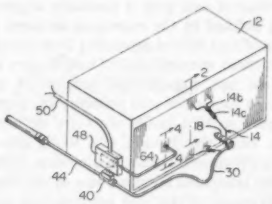
U.S. Cl. 62—183 **2 Claims**

1. Apparatus for applying a liquid mist to the heat exchange portion of a condenser of an air conditioner system, the heat exchange portion of the condenser having fluid conductors with fins attached thereto, and provided with a spray nozzle member, fluid conduit means joined to the spray nozzle member for supplying fluid thereto, comprising:

a support member attachable to the condenser for support of the support member by the condenser, the support member including connector means for connection to the spray nozzle member for support thereof, the support member retaining the spray nozzle member in position to spray liquid upon the fluid conductors and fins of the heat exchange portion,

said support member including an elongate base portion provided with a loop at each end thereof, a plurality of U-shaped stems, there being a U-shaped stem slidably extending through each loop and adjustable with respect thereto, each U-shape stem having a pair of hooks, the hooks being adapted to hook over a fluid conductor for support of the support member,

an electrically operable fluid valve member joined to the fluid conduit means for control of fluid flow into the fluid conduit means,



control means joined to the electrically operable fluid valve member for operation thereof,

a temperature sensing member in engagement with a portion of the fluid conductors and fins of the heat exchange portion of the condenser to sense the temperature thereof, and

means joining the temperature sensing member to the control unit for operation of the electrically operable fluid valve member in accordance with the temperature of said fluid conductors and fins of the heat exchange portion of the condenser.

4,170,118

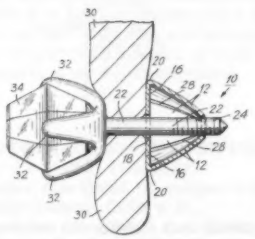
EARRING

Alvin Block, Bedford, N.Y., assignor to Intimate Jewels, Inc., Katonah, N.Y.

Continuation-in-part of Ser. No. 875,246, Feb. 6, 1978. This application May 22, 1978, Ser. No. 908,059

Int. Cl.[2] A44C *7/00*

U.S. Cl. 63—12 **1 Claim**



1. An earring for pierced ears which comprises an ornament in a setting, a rectilinear cylindrical post extending from said ornament setting, at least a portion of the outer surface of said post having a helical threading, and a clutch, said clutch having a central disc-shaped base portion having a circular central opening and a circular perimeter, and a plurality of spaced-apart springy fingers, said springy fingers extending radially from truncated terminal tips defining a circular opening, to a curved attachment to the circular outer perimeter of said base portion, said curved attachments forming, in combination, the circular outer perimeter of said base portion, so that said clutch is substantially conical, said clutch being engageable by said post by extending said post axially through the central opening

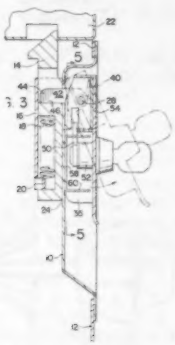
in said base portion and then through the opening defined by the terminal tips of said fingers, whereby the tips of said fingers pass over the convolutions of the threading, and so that said clutch cannot be disengaged from said post by reverse axial movement but may be disengaged from said post only by rotating said clutch, the circular central opening and the circular perimeter of the base portion of said clutch being concentric, and the circular opening defined by the truncated terminal tips of said fingers being coaxial with the circular central opening of the base portion of said clutch, so that, when said post is extending axially through the circular central opening in said base portion and then through the circular opening defined by the truncated terminal tips of said fingers, the helical threading on the outer surface of said post is coaxially aligned with the circular opening defined by the truncated terminal tips of said fingers, a portion of said helical threading then being contiguous with the truncated terminal tips of said fingers so that said truncated terminal tips engage said portion of said helical threading, adjacent fingers of said plurality of springy fingers being spaced apart so that radial slots are defined between adjacent fingers, each slot having side walls which diverge continuously away from each other in direction from the opening defined by the truncated terminal tips of the fingers to the circular outer perimeter of the base portion, said side walls of each slot being in substantial engagement with each other at the opening defined by the tips to thereby securely engage the post about substantially its entire periphery, said side walls of each slot being spaced further apart of each other at the circular outer perimeter to thereby increase the resiliency of the fingers thereat.

4,170,119

PADDLE HANDLE LOCK BOLT

George Kalis, Jr., Brunswick, Ohio, assignor to The Scott & Fetzer Company Stahl Division, Cleveland, Ohio

Filed Feb. 6, 1978, Ser. No. 875,234
Int. Cl.[2] E05C *1/14;* E05B *13/00*
U.S. Cl. 70—221 **4 Claims**



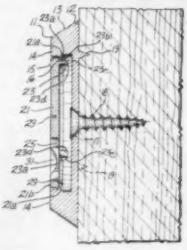
1. A paddle handle lock construction including, a pan member constituting a paddle handle frame pan, a spring-loaded bolt mounted on the outer bottom of the frame pan for sliding movement along the outer bottom past a first side of the frame pan, a pivot shaft extending between opposed second and third sides of the frame pan near and parallel to said first side of the frame pan, a paddle handle having a front wall normally partially covering the pan interior and top and bottom flanges extending interiorly of the pan adjacent said opposed second and third sides thereof, each of said flanges being pivotally received on the pivot shaft, a bellcrank retractor pivotally received on the pivot shaft between said paddle handle flanges and having one arm extending through the bottom of the frame pan and drivingly engageable with the bolt, and a second arm drivingly engageable and disengageable by a lug carried by a cylinder lock which itself is carried by and bodily moves with the paddle handle and projects from the interior side thereof, the lug being disengaged from the second arm by rotation of the cylinder lock to lock position and engaged by rotation of the cylinder lock to unlock position, the paddle handle, bellcrank, and sliding bolt comprising a three-element bolt-retraction train in which the first element of the train and the central element of the train, i.e., the paddle handle and the bellcrank, are coupled and uncoupled by said engagement and disengagement of said second arm and said lug to thereby govern actuation of the third element of the train, i.e., the bolt.

4,170,120

SIMULATED DEAD BOLT LOCK FOR DETERRING BURGLARS

Murray Feltman, 76-6246 Alii Dr., #226, Kailua-Kona, Hi. 96740, and David L. Fields, 6843 43rd NE., Seattle, Wash. 98115

Filed Mar. 21, 1978, Ser. No. 888,772
Int. Cl.[2] E05B *17/00*
U.S. Cl. 70—431 **5 Claims**



1. A simulated dead bolt lock capable of being installed on a door comprising:

a collar having a back surface, beveled side surfaces and a front surface, said front surface being formed with a recess for receiving a keyway insert therein;

means disposed within said recess for fastening said collar to said door with said back surface in contact with such door, and means for resisting rotation of said collar when so fastened to such door;

a keyway insert shaped so as to be received within said recess in said front surface of said collar and including means defining a keyhole, said keyway insert when received within said recess acting to cover and thereby hide said means for fastening said collar to said door; and

retaining means associated with said keyway insert and said collar for permanently and nonrotatably securing said keyway insert within said recess of said collar.

4,170,121

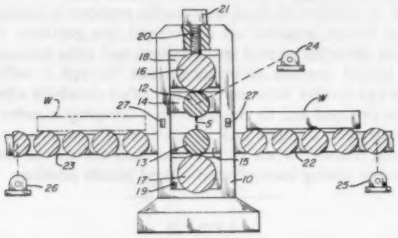
PROTECTIVE DEVICE FOR ROLL STANDS AND THE LIKE

David L. Koon, LaPorte, Tex., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 11, 1978, Ser. No. 904,962
Int. Cl.[2] B21D *55/00;* B21B *33/00*
U.S. Cl. 72—1 **8 Claims**

1. The combination, with a machine which receives a workpiece, performs an operation thereon, and requires resetting before receiving a new workpiece, of a protective device which prevents reception of the new workpiece unless the machine has been reset, said device comprising electronic means which is set as a workpiece leaves the machine and

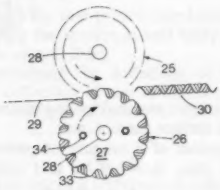
thereby prevents reception of another workpiece, and means connected with said electronic means for resetting the electronic means to permit reception of a new workpiece in the machine when the machine is reset.

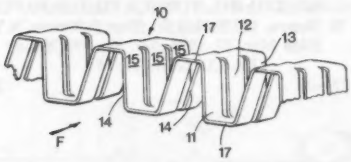


4,170,122
APPARATUS FOR MAKING CORRUGATED SHEET MATERIAL

Timothy A. T. Cowell, Canley, England, assignor to Covrad Limited, Canley, England

Filed Feb. 14, 1978, Ser. No. 877,628
Claims priority, application United Kingdom, Feb. 17, 1977, 06608/77
Int. Cl.[2] B21D *13/04*
U.S. Cl. 72—186 **10 Claims**



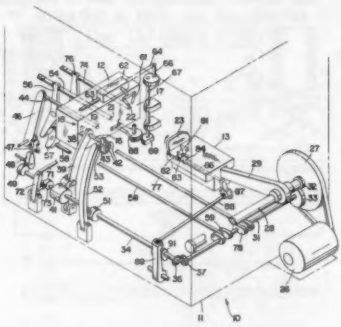


1. Apparatus for forming corrugated sheet material for heat exchangers, comprising a pair of rolls, and drive means for driving at least one of the rolls so that the rolls rotate in opposite directions, each roll being formed of a set of laminae arranged side by side along the axis of the associated roll and each lamina in a set having a corrugated profile with circumferentially spaced teeth, the teeth of adjacent laminae in a set being angularly displaced from one another about the axis of the associated roll an amount no more than one sixth of the pitch of the teeth in the same angular sense, and the teeth of one set of laminae being arranged in mesh with the teeth of the other set of laminae; the rolls being so arranged that on feeding sheet material between the rolls, corrugated sheet is formed which includes a unitary structure including a plurality of corrugated strips preferably each being similarly shaped and the corrugations in adjacent strips being displaced from one another in the longitudinal direction of the strips by an amount corresponding to said angular displacement of the laminae so as to provide at least three strips which are offset from the preceding strip in the same direction.

4,170,123
CONVERTIBLE MULTIPLE BLOW TWO DIE COLD HEADER

James R. Berger, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Filed Feb. 3, 1978, Ser. No. 874,885
Int. Cl.[2] B21D *22/00*; B21K *1/44*
U.S. Cl. 72—356 **14 Claims**



1. A metal forming machine comprising a frame, a die block mounted on the frame, a slide reciprocably mounted on the frame along a line of movement towards and away from the die block and adapted to carry tools thereon, the die block having first and second die stations spaced from each other along a direction perpendicular to the slide line of movement, means including drive means for transferring a workpiece from the first die station to the second die station in timed relationship to movement of the slide, means for cyclically shifting the position of tools on the slide in timed relationship to the movement of the slide, the drive means of said transfer means being constructed and arranged to permit tools carried in one selected pattern on the slide to operate selectively on a single workpiece once and with tools carried on the slide in another selected pattern a greater predetermined number of times at the first die station, and with the same construction and arrangement selectively on a single workpiece once with a suitable pattern of tools carried on the slide and said greater predetermined number of times with a pattern of tools different from said suitable pattern at the second die station.

4,170,124
HYDRAULIC CONTROL SYSTEM FOR PRESS BRAKES AND THE LIKE

Robert MacGregor, Blue Island, Ill., assignor to Dreis & Krump Manufacturing Company, Chicago, Ill.

Continuation of Ser. No. 620,930, Oct. 9, 1975, abandoned, which is a division of Ser. No. 359,220, May 11, 1973, Pat. No. 3,913,450. This application Dec. 13, 1977, Ser. No. 860,235
Int. Cl.[2] B21D *7/06*
U.S. Cl. 72—389 **7 Claims**

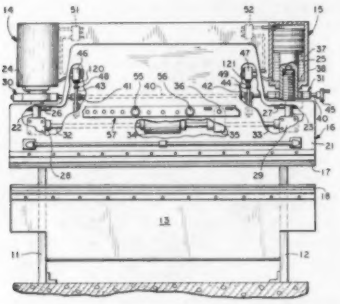
1. In a hydraulic press brake of the type having a frame, a bed and a ram having a forward working end and a rear driving end and disposed to reciprocate on said frame along a defined operating path whereby said forward working end is caused to alternately move toward and away from said bed, an actuator and control system for said ram comprising, in combination:

a pair of hydraulic cylinders mounted on said frame adjacent opposite sides of said ram, said cylinders each having a housing defining an inner chamber, a piston slidably disposed to reciprocate within said chamber in a direction parallel to said defined operating path, and a mechanical

stop for limiting the maximum downward travel of said piston to a predetermined bottom position with respect to said bed;

means for limiting the maximum upward travel of said piston to a predetermined top position with respect to said bed, including hydraulic valve means associated with each piston for selectively controlling the flow of hydraulic fluid thereto for upward movement,

actuator means carried by said ram and cooperatively associated with said hydraulic valve means to operate said valve means when said piston reaches the desired upward travel limit;



ram suspension means including a pair of jackscrews each attached at one end to respective sides of said ram and arranged for free rotation with respect thereto, and each turned into complementarily-threaded bores in respective ones of said pistons at their other end whereby the sides of said ram are suspended from said pistons at respective predetermined spacings with respect to said pistons; and

ram height adjustment means for rotating said jackscrews to adjust said spacings between said ram and said pistons, and hence the bottom and top travel limit of said ram along said defined operating path when said pistons reach said predetermined bottom and top positions respectively.

4,170,125

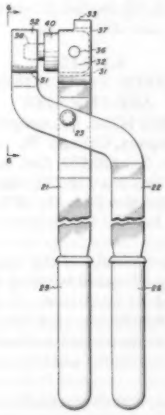
TOOL FOR CRIMPING FERRULES ON CONDUITS

Peter Minka, 269 Mt. Vernon Ave., Rochester, N.Y. 14620

Filed Oct. 10, 1978, Ser. No. 949,896

Int. Cl.[2] B21D *9/00;* **B25B** *27/00;* **B21D** *9/07*

U.S. Cl. 72—410 **7 Claims**



1. A portable hand tool for crimping a ferrule on an end of a flexible conduit, said tool comprising two members pivotally connected to each other to provide two handle portions adapted for swinging movement toward and away from each other upon manipulation by the hands of a user and two jaw portions movable toward and away from each other in response to manipulation of said handle portions, a ferrule receiving fixture mounted on one of said jaw portions, and a yoke on the other of said jaw portions, said yoke having two arms spaced laterally from each other through a sufficient distance to receive between them a conduit on which a ferrule is to be crimped and to engage with a crimping member surrounding such conduit and to exert axial pressure on said crimping member when said jaw portions are moved toward each other during manipulation of said handle portions.

4,170,126

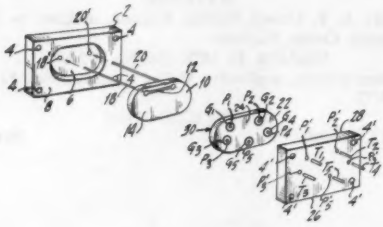
THERMAL CONDUCTIVITY CELL WITH THICK FILM SEAL

John S. Craven, West Grove, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 13, 1978, Ser. No. 885,824

Int. Cl.[2] G01N *31/00*

U.S. Cl. 73—27 A **12 Claims**



9. A body of ceramic material having means defining at least one opening in a surface thereof, and

a gasket comprised of a mixture of particles of gold and particles of glass mounted on said surface around said opening.

4,170,127

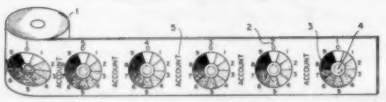
CALIBRATED OIL BURNER FILTER PAPER

Anthony W. Butera, 112 Tuthill St., Port Jefferson, N.Y. 11777

Filed Mar. 27, 1978, Ser. No. 890,784

Int. Cl.[2] G01N *21/18*

U.S. Cl. 73—28 **2 Claims**

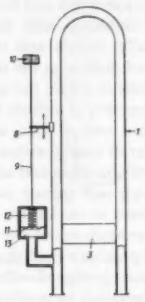


1. In a filter test paper or the like for use in a sampling and testing of the smoke of an oil burner and for indicating a "Smoke Spot Number" of the smoke content of flue gases when compared to standard gray smoke scales, the imprint comprising: said roll of filter test paper provided with a plurality of evenly spaced repeating calibrated gray smoke scales, each of said gray scales having at least one form of preselected geometrical shapes, each of the gray scale shapes evenly divided into sectors of different "Smoke Spot Number" indicating density, said calibrated gray smoke scales located centrally on said test paper, whereby a sample test smoke spot will appear adjacent to a selected one of the calibrated gray smoke scales during the smoke test and "Smoke Spot Number" content of the flue gas can be visually determined by comparing the sample test smoke spot with said one of the calibrated gray smoke scales.

4,170,128
APPARATUS FOR DENSITY DETERMINATION

Otto Kratky, Drosselweg 15; Hans Leopold, August-Musgergasse 4, both of A-8010 Graz, and Hans Stabinger, Peterstalstrasse 156, A-8042 Graz, all of Austria

Filed Nov. 29, 1977, Ser. No. 855,804
Claims priority, application Austria, Nov. 29, 1976, 8831/76
Int. Cl.[2] G01N *9/00*
U.S. Cl. 73—30 12 Claims

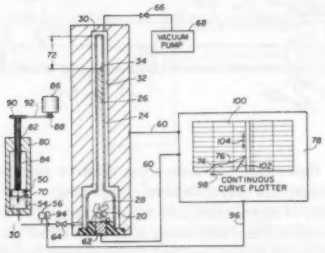


1. An apparatus for the measurement of the density of a fluid, by the determination of the characteristic frequency of a vibrating tube filled with said fluid, comprising:
- a tube-shaped element filled with said fluid;
- means for vibrating said element transverse to its longitudinal axis;
- an elongate relatively thin pretensioned body;
- means for varying the tension in said body in response to a characteristic of said fluid;
- means for transmitting the deflection of the tube-shaped element to a deflection of part of said body, and the force of said body resisting deflection to said element.

4,170,129
METHOD OF DETERMINING PORE VOLUME DISTRIBUTION OF A POWDER SAMPLE BY MERCURY INTRUSION

Seymour Lowell, 42 Wood Hollow Rd., Albertson, N.Y. 11507

Filed Mar. 15, 1978, Ser. No. 886,731
Int. Cl.[2] G01N *15/08*
U.S. Cl. 73—38 2 Claims

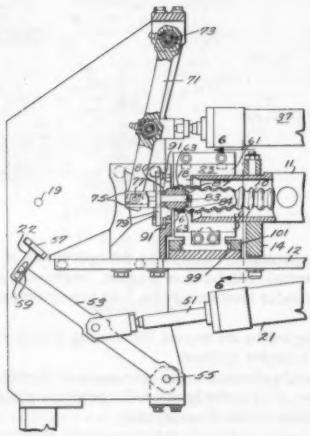


1. A method of determining the pore volume distribution of a powder sample by intruding mercury into said powder sample, said method comprising the steps of placing said mercury in intruding relation to said powder sample, arranging for movement along a delineated movement path of a mercury-displacing means disposed in pushing relation to said mercury, bounding said delineated movement path and embodying said mercury-displacing means with intermeshing threads, continuously unthreading said mercury-displacing means from said path-bounding threads incident to causing intrusion of said mercury into said powder sample, obtaining measurements of the continuously ascending pressure pattern of said mercury-displacing means resulting from said unthreading, and operating a continuous curve plotter using said measurements, whereby said mercury intrusion into said powder sample is in said aforesaid continuous ascending pressure pattern and is produced as a plotted curve of the pore volume distribution of said powder sample.

4,170,130
HOLLOW CONTAINER FAULT DETECTOR

Phillip E. Borror, and Jerome A. Kwiatkowski, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Jul. 9, 1975, Ser. No. 594,553
Int. Cl.[2] G01M *3/28*
U.S. Cl. 73—49.1 14 Claims



1. A fault detector for automatically detecting leaks in a train of hoses moving with respect to said detector comprising in combination;
- an elongated test chamber having an open front end and an open rear end,
- means for sensing when the trailing edge of one of said hoses has passed a predetermined point while entering said chamber,
- means responsive to said sensing means for positioning the trailing edge of said hose with respect to the front end of said chamber,
- means for clamping the leading and trailing ends of said hoses after a hose has been positioned in said chamber, said clamping means sealing the respective ends of said elongated test chamber,
- means for sealing the open ends of said hose, said means including a radially expandable plug member, means for positioning one of said plug members in each end of said hose after said hose is clamped, and means for expanding said plug member to force said leading and trailing edges of said hose against said clamping means to thereby seal the inside of said hose with respect to said test chamber,
- means for applying a predetermined pressure to the inside of said test chamber,
- means for detecting the pressure inside of said hose a predetermined time after said pressure in said test chamber is increased,
- means responsive to said detected pressure level for determining whether a leak of unacceptable magnitude exists in said hose,
- means for releasing said pressure in said test chamber,
- means for releasing said sealing means from said hose ends,
- means for unclamping said hose, and

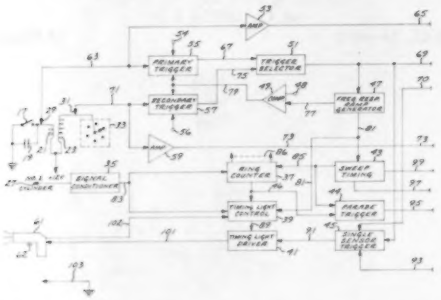
means responsive to said pressure determining means for transferring said hose to a location dependent upon whether an unacceptable leak has been detected.

4,170,131

SINGLE SENSOR ENGINE ANALYZER WITH NOISE REJECTION AND AUTOMATIC TRIGGERING CIRCUIT

Stephen A. Gniewek, Alta Loma, and Dick M. Olsen, Pasadena, both of Calif., assignors to Clayton Mfg. Co., El Monte, Calif.

Filed Nov. 25, 1977, Ser. No. 854,768
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—116 **3 Claims**



1. In an apparatus for analyzing the operations of a multiple cylinder internal combustion engine, improved means for detecting cylinder ignition signals, said improvement comprising:

means coupled to the engine for sensing signals representative of cylinder ignition;

one-shot multivibrator means responsive to the signals representative of cylinder ignition for generating a short pulse in response to the input signals;

a constant peak-amplitude ramp generator means responsive to the short pulses from said one-shot multivibrator for generating ramp signals varying in slope in relation to the frequency of the short pulses received; and

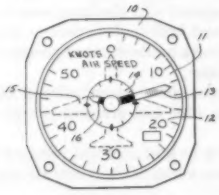
an amplitude comparator means receiving the ramp signals from said ramp generator means for providing a first level output whenever the amplitude of the ramp signal exceeds a predetermined amount or providing a second level output whenever the amplitude of the ramp signed is below the predetermined amount, said signal levels being supplied to said one-shot multivibrator means to enable and disable, respectively, the triggering of said one-shot multivibrator means.

4,170,132

AIRSPEED AND RELATIVE DIRECTION INDICATOR

James E. Serley, Bloomington, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Dec. 16, 1977, Ser. No. 861,102
Int. Cl.[2] G01C *21/10*
U.S. Cl. 73—178 T **2 Claims**



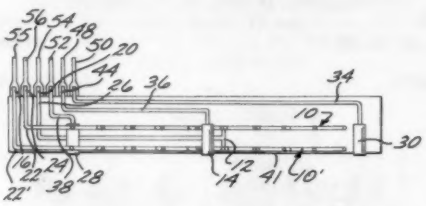
1. An apparatus for installation in an aircraft for providing a single visual display of the direction of airflow relative to the fore and aft axis of the aircraft and also the speed of airflow relative to a sensor mounted at a desired location comprising a face panel fixed in the aircraft including an annular array of first indicia indicating increasing relative airflow speed in clockwise direction from a zero reference point on a desired axis of the face panel, a first pointer needle rotatably mounted relative to the face panel for association with said first indicia, means coupling the sensor to the first pointer needle to rotate the first pointer needle in response to measured airflow speed values relative to said face panel and said first indicia, a second pointer needle rotatably mounted with respect to the face panel, about a substantially central axis on the face panel, means responsive to sensed airflow at the sensor and coupled to the second pointer needle to rotate the second pointer needle to indicate relative direction of airflow at said sensor with respect to the aircraft fore and aft axis, and second indicia representing a known aircraft configuration fixed on said face panel and separately identifiable from said annular array of first indicia and associated with said second pointer needle, said second indicia being oriented so the known aircraft configuration fore and aft axis corresponds to the fore and aft axis on the aircraft in which the face panel is mounted, and the zero reference point for the first indicia is aligned with the leading end of the known aircraft configuration to provide direct indication of the relative direction of airflow with respect to the known aircraft configuration.

4,170,133

PLANAR HELICAL FLOWMETER

William L. Gardner, 9818 Etiwanda Ave., Northridge, Calif. 91325

Filed May 8, 1978, Ser. No. 903,823
Int. Cl.[2] G01F *1/58*
U.S. Cl. 73—194 EM **11 Claims**



1. In a flowmeter for measuring relative velocity of fluid flow therepast, the improvement comprising:

a plurality of signal electrode means arranged to contact said fluid and in linear alignment with each other normal to the direction of fluid flow, and laminar spirally wound electromagnetic field producing means in co-planar arrangement with said signal electrode means electrically insulated from said fluid by a separating surface and arranged parallel to a direction of fluid flow to produce a magnetic field normal to its laminar orientation at said separating surface to induce an alternating current voltage field in said fluid parallel to said field producing means at said separating surface thereof and perpendicular to the direction of fluid flow, thereby inducing an alternating current in said signal electrodes proportional to the velocity of fluid flow and in phase with said magnetic field.

4,170,134
FLUID-FLOW PRESSURE-SENSING DEVICE

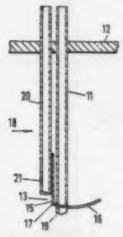
Matthew L. Nathan, 10 Sterling St., London SW7 1HN, England

Filed Nov. 18, 1977, Ser. No. 852,701

Claims priority, application United Kingdom, Nov. 26, 1976, 49413/76

Int. Cl.[2] G01F *1/46*

U.S. Cl. 73—212 **10 Claims**



1. A fluid flow pressure-sensing device comprising a conduit extending into a fluid flow-carrying duct, pipe or channel from a wall thereof and a baffle near the inner end of the conduit, the baffle having two surfaces meeting at an angle to each other at an edge, a first one of said two surfaces being upstream of the conduit and facing upstream, the second surface extending downstream from said edge, the first surface constituting means for producing a vena contracta in the fluid, the conduit projecting through the second surface close to said edge and having an opening into said vena contracta.

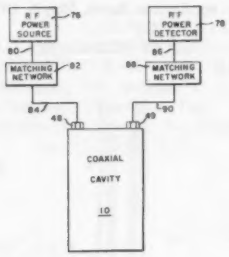
4,170,135
COAXIAL CAVITY FOR MEASURING LEVEL OF LIQUID IN A CONTAINER

Glenn L. Booman, Nesconset, N.Y., and Frank R. Phelps, Arco, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 26, 1978, Ser. No. 945,926

Int. Cl.[2] G01F *23/28*

U.S. Cl. 73—290 R **15 Claims**



1. A method for measuring the level of liquid in a container utilizing a coaxial cavity having an inner conductor coaxially suspended within a tubular outer conductor, the outer conductor having perforations to allow liquid surrounding the coaxial cavity to enter and terminate a portion of an annular region between the inner conductor and the outer conductor, the steps in the method comprising:

partially submerging the coaxial cavity in the liquid in the container so that liquid enters and terminates a portion of the annular region between the inner conductor and the outer conductor, leaving a liquid-free portion in the annular region;

injecting a sinusoidal electric field into the liquid-free portion of the annular region;

varying the frequency of the electric signal while simultaneously monitoring the output power level in the liquid-free portion of the annular region for maximum and minimum output-power levels, the n_{th} harmonic resonant frequencies of the liquid-free position of the coaxial cavity are equal to the frequencies of the electric signal at which maximum or minimum output power levels occur; and

determining the level of liquid in the container from the n_{th} harmonic resonance frequencies and the dimensions of the container according to a predetermined scheme.

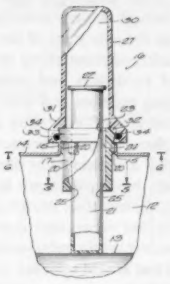
4,170,136
LEVEL INDICATOR FOR FROZEN CONFECTION DISPENSER

Tom M. Martineau, Kiel, Wis., assignor to Stoelting, Inc., Kiel, Wis.

Filed Aug. 2, 1978, Ser. No. 930,305

Int. Cl.[2] G01F *23/06*

U.S. Cl. 73—322 **6 Claims**



1. In a tank level indicator having a mounting sleeve and a floating indicator rod freely slidably mounted in the sleeve and in which the indicator rod picks up a film of liquid from the tank and carries it up into the sleeve, the improvement in which said sleeve has an inner wall from which projects inwardly a series of circumferentially spaced guide pads and gaps therebetween to guidingly support the rod in spaced relation to said inner wall for free movement in said sleeve and keep the film of liquid from rubbing onto the sleeve wall.

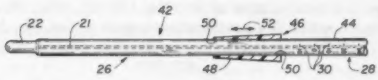
4,170,137
THERMOMETER AND INTEGRAL JOINT

William A. Ridgley, 252 N. Atlanta Ave., North Massapequa, N.Y. 11758

Continuation-in-part of Ser. No. 840,649, Oct. 11, 1977, abandoned. This application Sep. 21, 1978, Ser. No. 944,259

Int. Cl.[2] G01K *1/14*

U.S. Cl. 73—343 R **10 Claims**



1. A thermometer comprising:

an elongated glass thermometer rod having an outer periphery of a predetermined configuration, a mercury chamber of uniform diameter throughout the length of the rod and a sight stripe along the length of the rod and spaced from the mercury chamber to render the same visible for viewing the mercury therein, said rod being of a predetermined length to provide for a thermometer of a preselected length;

a separate plastic connecting member for engagement with containers and the like of a length substantially less than that of said thermometer rod, said connecting member

having a selected cross-sectional configuration and a hollow interior of a configuration conforming to the outer periphery of the glass thermometer rod and said thermometer rod extending longitudinally through said connecting member for the length thereof, whereby the separate connecting member is adapted to encompass and be positioned about the outer periphery of said glass thermometer rod with the conforming interior opening of the separate connecting member mating with the outer periphery of the glass thermometer rod to define a fluid-tight seal therebetween, said glass thermometer rod and said separate connecting member each being initially separate elements complete in themselves and said separate connecting member having an end shape along the length of its outer periphery such that when the separate connecting member is positioned in encompassing relationship with the outer periphery of the glass thermometer rod it is moved to a selected point along the length of said glass rod to thereafter form an integral and unitary part of the thermometer as though it were initially formed therewith and to function as the sole joint of the thermometer;

and means at said selected point along and integral with the thermometer rod to distort and unitarily connect said separate connecting member and said glass thermometer rod at said selected point fluid-tightly and against relative movement such that said glass thermometer rod and said connecting member are essentially one;

said distortion means having a length longitudinally along said rod substantially less than the length of said connecting member such that when said connecting member is positioned in encompassing relationship with the outer periphery of said rod at said selected point the connecting member completely encompasses said distortion means and the longitudinally opposite ends of said connecting member extend beyond said distortion means to engage fluid-tightly about the outer periphery of said rod.

4,170,138

THERMOMETER AND METHOD OF MAKING SAME

Gerald L. Wiebe, 18 W. 077 Williamsburg La., Villa Park, Ill. 60181

Continuation of Ser. No. 645,183, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 454,511, Mar. 27, 1974, abandoned, which is a continuation-in-part of Ser. No. 350,801, Apr. 13, 1973, abandoned. This application Jan. 30, 1978, Ser. No. 873,502

The portion of the term of this patent subsequent to Sep. 9, 1995, has been disclaimed.

Int. Cl.[2] G01K *1/00;* F16B *11/00*

U.S. Cl. 73—371 **40 Claims**

1. A thermometer comprising: an elongated tubular shield of resilient transparent material having an internal surface which defines an elongated bore extending the length thereof; a solid core in said bore, substantially coextensive therewith and having a channel in the external surface of said core and extending longitudinally along at least a major portion of said core, the internal surface of said shield cooperating with said channel to form therebetween a capillary passage having an open end and a closed end; fluid reservoir means connected in liquid-tight relationship with said shield and communicating with the open end of said capillary passage; and a thermally responsive fluid contained in the interior of said reservoir

means; said fluid being adapted to expand into said capillary passage in response to an increase in temperature.

4,170,139

SAMPLING DEVICE FOR ANALYSIS OF MOLTEN METAL FOR HYDROGEN

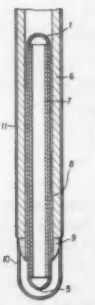
Kiichi Narita; Hiroshi Hara, both of Kobe; Masayuki Taniguchi, Ono; Masaru Yamaguchi, Akashi, and Iwao Matumoto, Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed May 3, 1978, Ser. No. 902,450

Claims priority, application Japan, May 6, 1977, 52-57788[U]; Dec. 21, 1977, 52-173109[U]

Int. Cl.[2] G01N *1/14*

U.S. Cl. 73—425.6 **7 Claims**

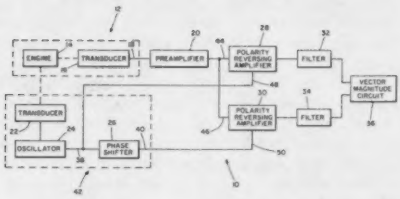


1. A sampling device for a determination of hydrogen in molten metal which comprises a refractory containment member having a thin-walled portion comparatively prepared to be destroyed by an external force and a material in which hydrogen is relatively non-diffusible or readily soluble, said material being housed in said refractory containment member and either a vacuum or a reduced pressure being maintained with said containment member.

4,170,140
AMPLITUDE DETECTION CIRCUIT

Mark C. Bowers, Rochester, Mich., assignor to Sun Electric Corporation, Chicago, Ill.

Filed May 18, 1978, Ser. No. 907,169
Int. Cl.[2] G01M 1/22
U.S. Cl. 73—462 6 Claims



1. In a system for testing an engine, said system producing a signal including a sinusoidal component, said sinusoidal component having an amplitude and a frequency dependent upon the speed of said engine, an improved means for determining said amplitude comprising, in combination:

trigger means coupled to said engine for generating a first trigger signal and a second trigger signal, said first trigger signal and said second trigger signal having a frequency dependent upon the speed of said engine, said second trigger signal corresponding to said first signal phase shifted a quarter cycle;

a first polarity reversing amplifier having a first input receiving said signal and a first trigger receiving said first trigger signal;

a second polarity reversing amplifier having a second input receiving said signal and a second trigger input receiving said second trigger signal;

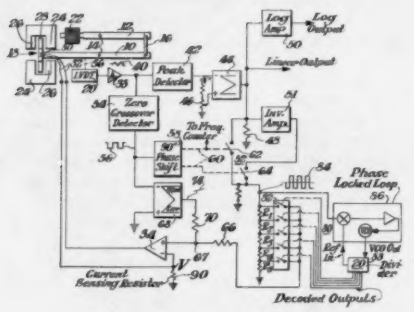
a first filter and a second filter connected to said first polarity reversing amplifier and said second polarity reversing amplifier, respectively; and

a vector magnitude circuit responsive to said first filter and said second filter.

4,170,141
METHOD AND APPARATUS FOR MEASURING THE LOSS MODULUS OF MATERIALS

Lecon Woo, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 24, 1978, Ser. No. 880,944
Int. Cl.[2] G01N 3/38
U.S. Cl. 73—579 5 Claims



1. A method for determining the loss modulus of a material using a dynamic mechanical system for subjecting said material to a vibratory mechanical displacement comprising the steps of:

displacing said material a finite distance with a periodic driving force that leads said displacement by about 90°,

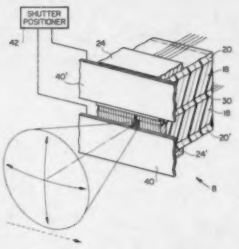
displacing said material said finite distance using a static driving force, thereby to deform said material to the same extent as with said periodic driving force,

dividing said periodic driving force by said static driving force to obtain the tangent of the loss angle for said material, from which the loss modulus may be calculated.

4,170,142
LINEAR TRANSDUCER ARRAY AND METHOD FOR BOTH PULSE-ECHO AND HOLOGRAPHIC ACOUSTIC IMAGING

Gerald J. Posakony; B. Percy Hildebrand, and Thomas J. Davis, all of Richland, Wash., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 15, 1977, Ser. No. 816,095
Int. Cl.[2] G01N 29/04
U.S. Cl. 73—603 20 Claims



1. A linear transducer array for both pulse-echo and holographic acoustic imaging, comprising:

(a) a linear subarray of transmitting transducer elements disposed in a plane and along a first axis, each element of the subarray being elongate and having a principal axis normal to the first axis;

(b) a linear subarray of receiving transducer elements co-planar with the transmitting subarray and disposed parallel to the first axis, each element in the receiving subarray being located adjacent to a corresponding element in the transmitting subarray; and

(c) a removable mechanical shutter adapted to block a predetermined portion of the transmitting elements so that a dispersive acoustic beam for holographic imaging can be generated.

4,170,143
RECOGNIZING ULTRASONIC RESPONSE SIGNALS DURING TESTING OF STRUCTURAL MATERIALS

Karl Ries; Dieter Kaiser, both of Mülheim; Mesa Quaye, Kaarst; Heinz-Jürgen Boms, and Klaus-Uwe Jannsen, both of Ratingen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

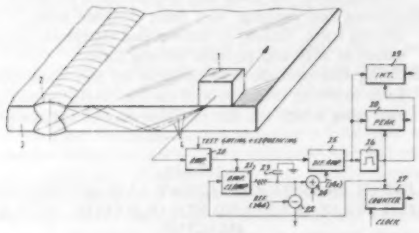
Filed Aug. 11, 1977, Ser. No. 823,704
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1976, 2636401
Int. Cl.[2] G01N 29/04
U.S. Cl. 73—609 4 Claims

1. In a method of testing structural materials by ultrasonic inspection using individual test pulses, comprising the steps of:

detecting a noise and background level in a signal path for received ultrasonic signals;

detecting and recognizing ultrasonic response signals having resulted from interaction of the test pulses with the structural material by detecting signal levels above a threshold level; and

varying the threshold level in accordance with the detected noise level to establish a dynamic response level for the



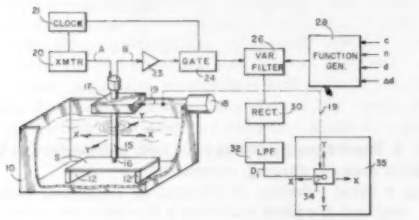
ultrasonic signal detecting on the basis of tracking the noise level.

4,170,144

MATERIAL SCANNING APPARATUS

William R. Scott, Doylestown, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 27, 1977, Ser. No. 846,231
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—609 **10 Claims**



1. Apparatus for measuring a property in a specimen of material, comprising:

transmitting means for transmitting a pulse of energy to the specimen at a selected location;

gating means receiving a response signal produced by said energy pulse in the specimen for selecting and passing a predetermined time-portion of the response signal as a gated electrical signal;

function generator means responsive to signals indicative of speed of sound in the specimen, order of the resonance extrema, nominal thickness of the specimen, and expected variation in specimen thickness for producing an output signal indicative of a frequency near one of the resonance extrema of the specimen;

filter means receiving the gated signal and the output signal for producing a filtered signal of narrow bandwidth centered about said frequency and comprising a variable frequency bandpass filter; and

indicating means receiving the filtered signal for indicating the amplitude of the filtered signal.

4,170,145

MECHANIZED SCANNING, DISPLAY AND RECORDING ULTRASONIC WELD INSPECTION SYSTEM

James C. Kennedy, and Wayne E. Woodmansee, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 28, 1977, Ser. No. 772,481
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—620 **26 Claims**

1. An ultrasonic weld inspection system for inspecting welded parts to determine the presence and location of flaws in elongate welds in said parts, said system comprising:

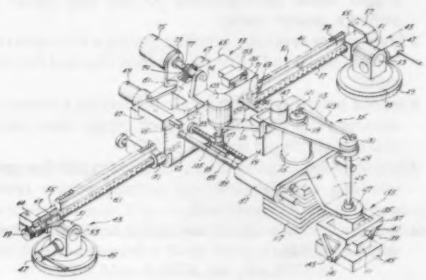
(A) ultrasonic means for producing ultrasonic signals suitable for penetrating a welded part and being reflected back and forth between opposing surfaces of said part and for receiving ultrasonic signals reflected by flaws in a weld in said part being inspected, said ultrasonic means including an ultrasonic transducer for directing said produced ultrasonic signals into said part in a direction such that said signals are reflected back and forth between opposing surfaces of said part and for receiving ultrasonic signals reflected by said weld flaws, said ultrasonic transducer adapted to be ultrasonically coupled by a film of liquid to and movable over one surface of said part;

(B) mounting means for supporting a scanning means on said one surface of said welded part along a line lying generally parallel to an elongate weld in said welded part;

(C) scanning means mounted on said mounting means for:

(1) supporting said ultrasonic transducer and continuously moving said ultrasonic transducer over said one surface of said part along a longitudinal axis lying generally parallel to said elongate weld in said part and about an oscillatory axis lying transverse to said one surface of said part such that said ultrasonic transducer is maintained ultrasonically coupled by said film of liquid to said one surface of said part over which said ultrasonic transducer is moved; and,

(2) producing position signals related to the position of said transducer along said longitudinal axis and about



said oscillatory axis, said scanning means including a scanning mechanism, said scanning mechanism comprising:

(a) an elongated track mounted on said mounting means so as to lie along said longitudinal axis;

(b) a translation carriage mounted on said elongated track;

(c) first movement means for moving said translation carriage along said elongated track; and,

(d) first position sensing means for sensing the position of said translation carriage along said elongated track;

(e) transducer support means mounted on said translation carriage for supporting said transducer;

(f) a shaft rotatably mounted on said transducer support means so as to lie along an axis orthogonal to said one surface of said welded part, the axis of said shaft forming said oscillatory axis, said transducer affixed to one end of said shaft so as to lie on the surface of a part when said mounting means supports said elongated track on said one surface of a part;

(g) second movement means connected to said shaft for oscillating said shaft; and,

(h) second position sensing means for sensing the oscillatory position of said shaft as said shaft is oscillated by said second movement means; and,

(D) a display system connected to: said ultrasonic means for receiving flaw presence signals related to the receipt of said ultrasonic signals by said ultrasonic means and to said scanning means for receiving said position signals, said

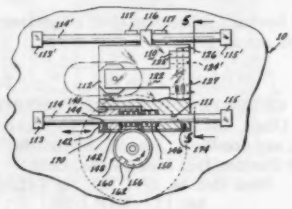
display system producing at least one display depicting the presence and location of flaws projected into a plane lying generally parallel to said elongate weld.

4,170,146

MECHANISM FOR TRANSFORMING ROTARY MOTION TO LINEAR MOTION ADAPTED FOR DRIVING A MAGNETIC HEAD

William M. Owens, La Palma, Calif., assignor to Micro Peripherals, Inc., Woodland Hills, Calif.

Filed Aug. 18, 1977, Ser. No. 825,524
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—89.2 **4 Claims**



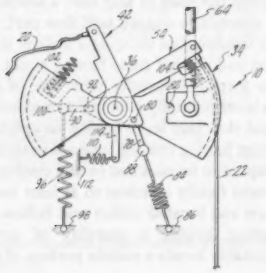
1. In an apparatus including record means and record drive means, the record means having a plurality of tracks, megnetic head means movable relative to the said tracks, the head means being mounted for linear movement, the improvement including actuating means for imparting linear movement to the head means, the said actuating means including a stepper motor having an output rotor member, a flexible member having wrapped engagement with the said rotor member, an end part of said flexible member having attachment to the head means whereby angular movement of the said rotor imparts linear movement to the said head means, and resilient means having securement to the other end part of said flexible member and arranged to tension said member.

4,170,147

REDUNDANT FLIGHT CONTROL SYSTEM

Ronald A. Durno, and Dean E. Cooper, both of Trumbull, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 27, 1977, Ser. No. 846,094
Int. Cl.[2] F16H *21/44*
U.S. Cl. 74—96 **7 Claims**



1. A flight control system including:

(A) a quadrant member mounted for clockwise and counterclockwise motion about an axis of rotation and including a left arm member and a right arm member extending on opposite sides of the axis of rotation,

(B) output means responsive to quadrant rotation,

(C) a first flexible cable member connected to the quadrant right arm to cause clockwise rotation thereof,

(D) a second flexible cable member connected to the quadrant left arm to cause counterclockwise rotation thereof,

(E) a pair of balancing spring members with a first spring member thereof connected to the right arm of the quadrant member and the second spring member connected to the left arm of the quadrant member so as to impose a balanced centering force on said quadrant member,

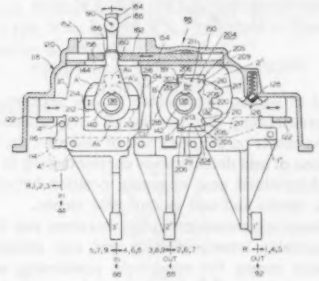
(F) means responsive to the severing of one of said flexible cable members to inactivate one of said balancing spring members so that the remaining balancing spring member imparts a force to the quadrant member to cause it to rotate in one direction about its axis of rotation while a tensioning force applied to the unsevered flexible cable member will cause the quadrant member to rotate in the opposite rotational direction about its axis of rotation to selectively position the quadrant member.

4,170,148

DOUBLE OSCILLATING MOTION-SINGLE LINEAR MOTION CAM

Robert W. Wolfe, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Nov. 21, 1977, Ser. No. 853,073
Int. Cl.[2] G05G *9/12, 5/10*
U.S. Cl. 74—337.5 **16 Claims**



1. In a speed change transmission having shift rails to effect speed changes, a shaft carrying a double oscillating motion - single linear motion cam, a cam follower surface in a shift rail adapted to cooperate with said cam to effect axial movement of said shift rail in one and the same direction upon both clockwise and counterclockwise rocking of said shaft, said cam including substantially similar opposed upper and lower cam operating surfaces, each of which includes a tooth portion spaced from a cam end surface.

4,170,149

MULTI-SPEED TRANSMISSION WITH IMPROVED SHIFTING MEANS

Ralph A. Koegel, Brookfield, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 22, 1977, Ser. No. 826,850
Int. Cl.[2] F16H *3/38;* G05G *1/00*
U.S. Cl. 74—339 **24 Claims**

1. In a multi-speed transmission of the type including a supporting housing, a first power shaft means in axially spaced parallel relationship to a second power shaft means, a first gear means functionally associated with said first shaft means and a second gear means functionally associated with said second shaft means, said first gear means being axially reciprocally slidable along said first shaft means, said second gear means including a plurality of longitudinally spaced drive gear means, each one of which is individually gear engagable with said first gear means, the improvement which comprises in combination:

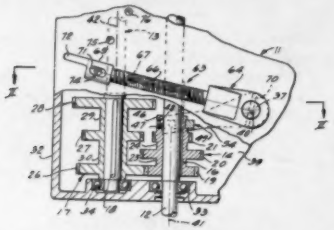
a lever arm assembly incorporating an elongated central portion thereof,

said central portion comprising a flexible means having a normally straight axis and being adapted for transverse flexural movements relative to said axis, in said central portion,

said flexible means requiring a predeterminable, substantial initial force to be laterally applied thereto before appreciable sidewise deflection thereof occurs, and which said flexible means, when once so initially deflected require only a minor additional force for achieving a further deflection thereof,

first connecting means extending between, and functionally interconnecting, said first gear means and one end of said arm assembly whereby pivotal movements of said arm assembly slidably moves said first gear means axially along said first shaft for shifting of said transmission and said gears thereof,

a plurality of detent means associated with said housing and



arranged in spaced relationship to one another along a path corresponding to a portion of a hypothetical circle having its center on the pivot axis of said arm, the location of each one of said detent means corresponding to a different predetermined gear engaging position between said first gear means and said second gear means,

second connecting means extending between and functionally detachably interconnecting said arm assembly and said detent means for selectively positioning said arm assembly relative to individual selected ones of said detent means whereby the interrelationship between said gear means and said lever arm assembly is such that when the teeth of said first and second gear means do not mesh, said arm assembly will flex sufficiently to allow such selection, and, at any time after such selection when alignment of said teeth occurs, said arm assembly will straighten and maintain itself substantially straight to achieve a desired gear engagement.

4,170,150

DRIVE UNIT FOR EXTRUSION DEVICE

Hans-Werner Selbach, Turmstr. 30, 4970 Bad Oeynhausen 7, and Manfred Diekmann, Loblenzer Str. 31a, 4972 Lohne 3, both of Fed. Rep. of Germany

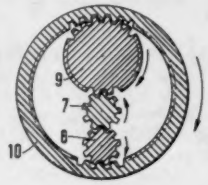
Filed Apr. 25, 1977, Ser. No. 790,755

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619019

Int. Cl.[2] F16H *57/00*

U.S. Cl. 74—410 **1 Claim**

1. A drive unit for imparting low deflection rotation in opposite directions to first and second parallel axes output shafts in close proximity to each other, said drive unit including a ring gear in which first and second equal size pinion gears together with an intermediate gear of greater size are disposed, a drive shaft disposed on the input size of said unit, said drive shaft and said first output shaft each connected to said first pinion gear and extending from opposite sides thereof, said second pinion gear connected to said second output shaft, said first pinion gear meshed with both said second pinion gear and said intermediate gear, both the second pinion gear and the intermediate gears meshed with said ring gear with the axes of all of said gears being located in a common plane, said interme-



diate gear having a supporting shaft of greater diameter than those of the output shafts.

4,170,151

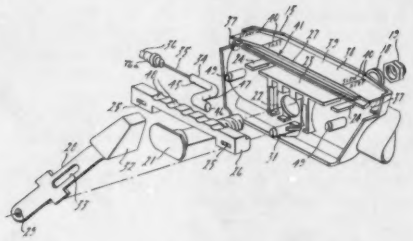
OPERATING UNIT FOR CONTROLS

Daniel H. Olson, Louisville; Larry R. Hunsicker, Canton, both of Ohio, and Stanley A. Johnson, Brookfield, Wis., assignors to Merit Plastics, Inc., East Canton, Ohio

Filed Oct. 14, 1977, Ser. No. 842,212

Int. Cl.[2] G01P *3/20*

U.S. Cl. 74—501 R **5 Claims**



1. In a remote actuating unit for controlling a controllable element to different positions from a remote point by means of a control wire, said controllable element having a tubular element associated therewith adapted for supporting said actuating unit, the combination comprising: a first part having an outwardly facing arcuate recess in a side thereof adapted to receive a portion of said tubular element, an aperture in said recess for receiving a bolt therethrough and an inner recess adapted to receive the head of said bolt; a second part having edge portions adapted to engage said first part, said first and second parts in combination defining a hollow interor, at least one of said first and second parts having a slot in a top wall thereof; a boss formed integrally with one of said first and second parts; a lever pivotally attached to said boss and extending through said slot, said lever having an aperture therein; a Z-shaped element having one leg retained in said aperture and another leg adapted to be attached to said control wire; and an elongated element fixidly attached to at least one of said first and second parts and located within said hollow interior, said elongated element having a plurality of notches therein adapted to adjustably locate a middle portion of said Z-shaped element.

4,170,152

TRANSMISSION ARRANGEMENT

Willis E. Windish, Pekin, and James E. Winzeler, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 7, 1977, Ser. No. 813,587

Int. Cl.[2] F16H *57/02*

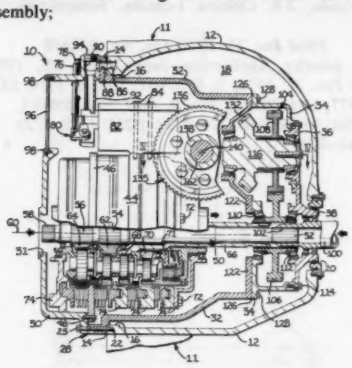
U.S. Cl. 74—606 R **12 Claims**

1. A transmission arrangement for a vehicle having a

longitudinal axis, a rearwardly disposed case, and a rear opening defined in said case, comprising:

a housing assembly of a construction sufficient for extending forwardly through said rear opening and being releasably secured to said case about the periphery of said opening;

a transmission having an output shaft located on said axis, said transmission being mounted within said housing assembly;



a transfer gear train driven by said output shaft and mounted within said housing assembly; and

a bevel gear and cross shaft assembly mounted within said housing assembly on a transverse axis located elevationally above said longitudinal axis and driven by said transfer gear train, said bevel gear and cross shaft assembly being located longitudinally between said transmission and said transfer gear train.

4,170,153

HYDROMECHANICAL TRANSMISSION

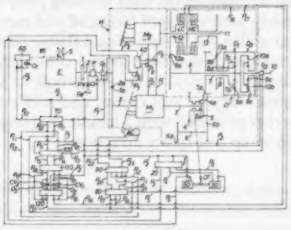
Kiyohumi Mizuno, Nagoya; Hiroaki Maeda, Toyota, and Shigeo Takahashi, Chiryu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Apr. 15, 1977, Ser. No. 787,931

Claims priority, application Japan, Apr. 15, 1976, 51-42776; May 28, 1976, 51-625977

Int. Cl.[2] B60K *21/00, 41/04*

U.S. Cl. 74—868 **3 Claims**



1. In a hydromechanical transmission comprising:

an input shaft (2);

an output shaft (10);

a hydraulically controlled differential gear unit (D_1, D_2) for selectively providing low and high speed drive power trains between said input and output shafts;

a first positive displacement pump-motor (M_1) drivingly connected to one of said input and output shafts;

a second positive displacement pump-motor (M_2) hydraulically connected with said first pump-motor (M_1);

clutch means (LC, HC) for switching over said low speed drive power train to and from said high speed drive power train when an actual speed ratio of said output shaft to said input shaft reaches a predetermined speed ratio (e^*);

a fluid actuator (AC) for varying the displacement capacity of one of said pump-motors to control the actual speed ratio; and

a speed responsive valve (70) for controlling fluid pressure applied to said actuator from a source of fluid pressure (P) in accordance with a first signal responsive to a throttle opening angle and a second signal responsive to the rotational speed of said input shaft;

the improvement comprising:

speed ratio detecting means (100) for detecting changes of the actual speed ratio to generate a first shift signal when the actual speed ratio increases to a first value ($e_1{}^*$) slightly lower than the predetermined speed ratio (e^*) and a second shift signal when the actual speed ratio decreases to a second value ($e_2{}^*$) slightly higher than the predetermined speed ratio (e^*);

clutch control means (120) for activating said clutch means (LC, HC) in response to either the first or second shift signal from said speed ratio detecting means; and

means for delaying each of the first and second shift signals applied to said clutch control means from said speed ratio detecting means to prevent activation of said clutch means immediately after increasing or decreasing of the actual speed ratio to the first value or the second value.

4,170,154

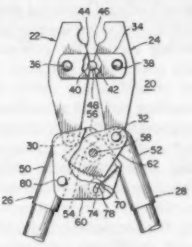
FULL STROKE COMPELLING MECHANISM

Hyman Izraeli, West Caldwell, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 6, 1977, Ser. No. 858,075

Int. Cl.[2] B25B *7/02*

U.S. Cl. 81—313 **8 Claims**



1. In a tool of the type having jaw means driven by handle means which are coupled to a full-stroke compelling mechanism having cooperatively coupled ratchet means and pawl means wherein said ratchet means includes a toothed portion and is coupled to one of said handle means and said pawl means is coupled to the other of said handle means and has a nose portion spring biased into selective engagement with said toothed portion of said ratchet means to provide free movement of said handle means in a jaw closing direction while resisting the reverse movement of said handle means before completion of the jaw closing stroke the improvement comprising: means for slidably shifting said pawl means along a predetermined path towards and away from said ratchet means in response to a predetermined direction of movement of said ratchet means, said ratchet means being movable in a first direction corresponding to the closing of said jaw means and in a second direction corresponding to the opening of said jaw means, said pawl means assuming a first inclination relative to said toothed portion of said ratchet means when said ratchet means is moved in said first direction and assuming a second inclination relative to said toothed portion of said ratchet means when said ratchet means is moved in said second direction, said means being arranged to shift said pawl means away from said ratchet means and from said second inclination to said first inclination when said ratchet means is moving in said

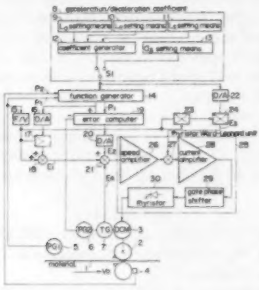
second direction and is subjected to a force tending to reverse its direction of movement, said predetermined path being substantially perpendicular to the axis of said first inclination of said pawl means and substantially parallel to the axis of said second inclination of said pawl means.

4,170,155

ROTARY CUTTER FOR SUCCESSIVELY CUTTING MOVING MATERIAL TO LENGTHS

Minoru Saito, Odawara, and Yutaka Matsumoto, Oicho, both of Japan, assignors to Nihon Electronic Industry Co., Ltd., Odawara, Japan

Filed Nov. 3, 1977, Ser. No. 848,359
Int. Cl.[2] **G05B** *19/28;* **B26D** *5/20*
U.S. Cl. 83—76 **8 Claims**



1. In a rotary cutter adapted for successively cutting a material to lengths in accordance with a rotary cutter rotational speed control pattern which is determined by the relation between a cutting length of said material and the circumferential length of said cutter, the combination comprising:

coefficient generating means for computing an acceleration/deceleration coefficient indicative of variation of the rotational speed of said rotary cutter for every material travel speed detecting pulse in accordance with a preliminarily set material-cutting length, rotary cutter circumferential length and cutter cutting distance;

function generating means for generating a rotary cutter speed control function in response to material travel speed detection pulses which are counted up or counted down in accordance with the acceleration/deceleration coefficient computed by said coefficient generating means and said rotary cutter rotational speed control pattern;

speed computing means for multiplying together the speed control function generated by said function generator and a material travel speed obtained by converting said material travel speed detection pulses to obtain a product and then adding said material travel speed to said product to generate a rotary cutter operating speed command signal;

error computing means for adding the sum of the speed control function generated by said function generator and said material travel speed detection pulse in response to the application of each said material travel speed detection pulse to compute the amount of rotation of said cutter and for subtracting an actually detected amount of rotation of said cutter form said computed amount of cutter rotation to generate a cutter follow-up error signal;

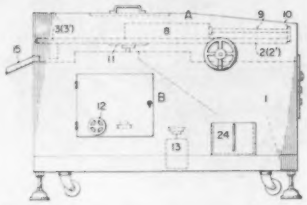
acceleration computing means for multiplying together the acceleration/deceleration coefficient computed by said coefficient generating means and a square of said material travel speed to generate an acceleration signal to control the amount of current which generates a DC motor driving torque necessary to accelerate or decelerate said cutter; and cutter speed controlling means including a speed amplifier and a current amplifier, said cutter speed controlling means being responsive to said operation speed command signal, said follow-up error signal and said acceleration signal for controlling a cutter driving DC motor, wherein said follow-up error signal is fed to said speed amplifier and said acceleration signal is fed to said current amplifier.

4,170,156

LEAD WIRE CUTTER

Kenshi Kondo, 3-5, Ohkura 1-chome, Setagaya-ku, Tokyo, Japan

Filed Jun. 21, 1977, Ser. No. 808,478
Claims priority, application Japan, Jun. 21, 1976, 51-80367[U]; Jun. 25, 1976, 51-82779[U]; Jul. 8, 1976, 51-80364; Feb. 9, 1977, 52-13598[U]; Feb. 9, 1977, 52-13599[U]
Int. Cl.[2] **B26D** *1/28, 7/24;* **B23C** *1/08, 5/26*
U.S. Cl. 83—418 **3 Claims**



1. A lead wire cutter comprising: a main body having mounted thereto an automatic conveyor mechanism for print circuit boards which conveys said print circuit boards one by one from one end to the other end, a cutter mechanism mounted in the path of conveying of said print circuit boards and provided on the top thereof with an openable observation window, said automatic conveyor mechanism for print circuit boards having a guide rail portion along which said print circuit boards are slidable, a pushing device capable of pushing said print circuit boards on said guide rail portion from one end to the other end and a piston capable of being reciprocally moved within a cylinder so as to operate said pushing device intermittently, said cutter mechanism comprising a metal blade having a central fixing hole forming a spot facing, a flange portion having an upper surface provided with a cut-out step portion comprising an annular surface receiving said metal blade and a vertically protuberant circular portion capable of being fitted with said central fixing hole of the blade, with a rotating shaft of the main body of a cutter and fitted in a tapered portion within a tapered shaft end of said rotating shaft and a fastening lid member having a pressing periphery portion in contact flexibly with said spot facing of said metal blade and a base engaged with a guide hole of said flange portion so as to fit the lower surface of said base to said central concave area and being fixed by a central fixing screwbolt to said rotating shaft of the main body of said cutter, and said cutter mechanism being further provided with a handle enabling adjustment of the position in up-and-down directions.

4,170,157

TRIMMING PIPE BENDS

Rolf Koser, 160, Holser Strasse, D-4980 Bunde, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,660
Int. Cl.[2] **B23D** *19/08*
U.S. Cl. 83—472 **2 Claims**

1. A machine, for the treatment of a pipe bend, comprising:

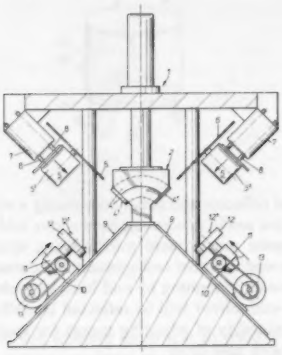
(i) a machine frame

(ii) means in said frame for holding a pipe bend in a predetermined position relative to the frame

(iii) two hydraulic rams each including a cylinder mounted on the machine frame, and a piston movable in the cylinder

(iv) two rotary cutter means each carried by a respective one of the pistons, the hydraulic rams being positioned on the frame in relation to the holding means such that each cutter means is movable by its ram normally to the axis of a respective end of the pipe bend, thereby to trim an end portion from the pipe bend

(v) a pair of slideways on the machine frame



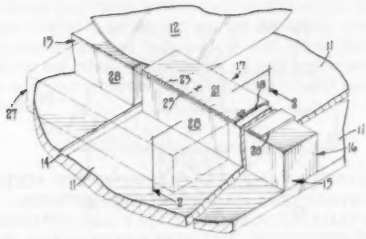
(vi) two swarf and burr-removing chamfering devices each carried on and movable along a respective one of the slideways, each chamfering device including a rotary cutting head, each slideway being positioned on the frame such that the respective rotary cutting head is movable coaxially towards and away from a respective trimmed end of the pipe bend.

4,170,158

RADIAL ARM SAW CUTTING GAUGE

John H. Weaver, 207 Hawkins Dr., Brainerd, Minn. 56401

Filed Jul. 13, 1978, Ser. No. 923,932
Int. Cl.[2] B27B *27/00*
U.S. Cl. 83—522 **5 Claims**



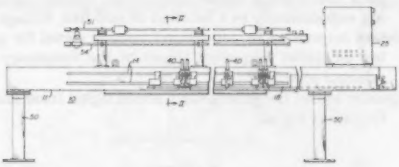
4. In a power driven radial saw including a workpiece supporting table having a rotary saw blade overlying said table and bodily moving transversely of the table, a workpiece guide bar on said table and extending transversely of the path of said bodily movement of said saw blade, said guide bar having a top surface, a workpiece engaging vertical front surface, and a vertical rear surface; the combination of a gauging device comprising; an elongated gauge bar bent along its longitudinal center to provide a pair of longitudinally extending flanges disposed at right angles to each other; said flanges having inner surfaces for longitudinal sliding engagement with selected ones of said top and rear surfaces of said guide bar, outer surfaces each having a plurality of longitudinally spaced dimension indicating transverse lines thereon, and opposite ends for selective engagement with the laterally outermost limits of the teeth of said saw blade at one side of said blade; said dimension indicating lines of one of said outer surfaces being calibrated in an arithmetical system differing from that of the lines of the other of said outer surfaces.

4,170,159

LINEAR POSITIONING APPARATUS

Paul F. McNally, Gibsonia, Pa., assignor to Contraves Goerz Corporation, Pittsburgh, Pa.

Filed Jan. 3, 1978, Ser. No. 866,693
Int. Cl.[2] C03B *33/02*
U.S. Cl. 83—562 **16 Claims**



12. Positioning apparatus comprising:

a work bed;

a bridge extending across said work bed;

a plurality of heads slidably supported from said bridge;

automatic positioning means for automatically positioning said heads at selected positions on said bridge;

said bridge and said heads constructed so that for any position of a head the adjacent heads can be moved into close proxmity thereto; and,

said automatic positioning means comprises,

a smooth rod movable along its longitudinal axis having said plurality of heads clamped thereto with a determinable friction force,

locking means for locking selected heads to said bridge with a force greater than the friction force, and,

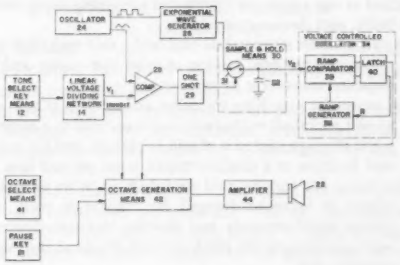
means for moving said smooth rod along its longitudinal axis.

4,170,160

ELECTRONIC MUSICAL INSTRUMENT

Jong Guo, 908 Beachpoint Way, Rodeo, Calif. 94572

Filed Jun. 9, 1978, Ser. No. 914,059
Int. Cl.[2] G10H *5/06, 5/10*
U.S. Cl. 84—1.01 **10 Claims**



1. An electronic musical instrument comprising:

tone select key means for enabling selection of one of twelve musical tones in a given octave interval, and including a sharp and a flat key;

a voltage dividing network for generating a first voltage signal corresponding to a selected said tone, said first voltage signal varying linearly as a function of the tone selected, said voltage dividing network comprising:

(i) a plurality of resistance elements connected in series, said resistance elements being substantially equal in value;

(ii) analog switch means responsive to the state of said

tone select key means for causing the voltage at a selected one of a plurality of junctions between adjacent resistance elements to be output as said first voltage signal;

(iii) means for modifying said selected junction voltage as a function of the manual selection of said sharp or flat key, such that said first voltage signal is modified to correspond to the next respective higher or lower tone, when such a modification would thereby emulate the same corresponding sharp or flat tone selectable on a standard musical keyboard;

means for generating a second voltage signal responsive to such first voltage signal, said second voltage signal varying exponentially as a function of said first voltage signal;

means responsive to said second voltage signal for generating an audio frequency signal of the frequency of the selected tone; and

speaker means for generating a sound signal from said audio frequency signal.

4,170,161

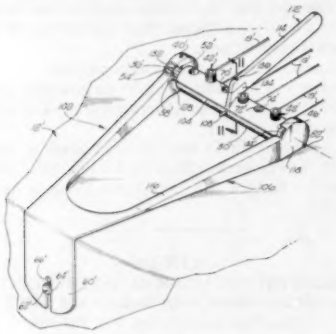
TUNING DEVICE FOR A STRINGED INSTRUMENT

William P. Kaftan, 26620 Fairway Dr., Idyllwild, Calif. 92349

Filed Aug. 4, 1977, Ser. No. 821,682

Int. Cl.[2] G10D *3/14*

U.S. Cl. 84—312 R **10 Claims**



1. A tuning device for a stringed musical instrument having a body and a plurality of generally aligned tensioned strings attached at one end to said body and extending along and over said body, said device comprising:

(A) a rockshaft mounted on said body, said rockshaft having a longitudinal axis, having at least one cavity and being disposed transverse to said strings;

(B) means for attaching the other end of each of said strings to said rockshaft so that said end is secured to a position on a line through said axis of said rockshaft, and for adjusting said position to a predetermined point on said line;

(C) means for turning said rockshaft so as to increase, decrease or leave unchanged the tension in each of said strings simultaneously and thereby increase, decrease or leave unchanged the pitch of each of said strings simultaneously; and

(D) means for limiting the extent of turning of said rockshaft, said means including,

(1) a stop lever attached to said rockshaft at one end thereof,

(2) a mounting for said rockshaft having a cavity for said lever,

(3) a first screw for limiting the extent of said turning in one direction in threaded engagement with said mounting and protruding into said cavity for said lever, and

(4) a second screw for limiting the extent of said turning in the other direction in threaded engagement with said mounting and protruding into said cavity for said lever.

4,170,162

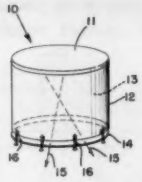
REFLECTOR AND DRUM

A. R. Casavant, Box 1124, Chattanooga, Tenn. 37401

Filed Dec. 16, 1977, Ser. No. 861,308

Int. Cl.[2] G10G *7/00;* **G10D** *13/02*

U.S. Cl. 84—453 **5 Claims**



1. A sound reflector and drum comprising a sound chamber and at least one sound generating head above said sound chamber, an acoustic mirror, said mirror being spatially aligned below said sound chamber and substantially outside thereof for receiving sounds generating by said head whereby said sounds received by said mirror will be reflected laterally, said mirror including a plurality of adjusting means for spatially aligning said mirror with said drum.

4,170,163

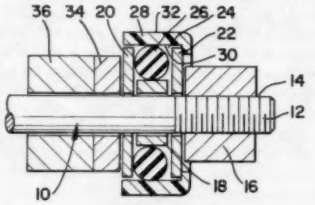
VISUAL INDICATOR

William J. Payne, Greensburg, Pa., assignor to Modulus Corporation, Chagrin Falls, Ohio

Filed Jul. 27, 1977, Ser. No. 819,487

Int. Cl.[2] F16B *31/02;* **G01L** *5/06*

U.S. Cl. 85—62 **16 Claims**



1. An indicator for sensing the degree of tension in a tensile member comprising in combination:

an indicator element, said element being deformable in response to the application of an external force;

force application means to apply an external force to said indicator element as a function of the tension applied to said tensile member;

containment means parallel to the longitudinal axis of the tensile member and adjacent said indicator element, said containment means having a viewing area in an exterior side wall thereof;

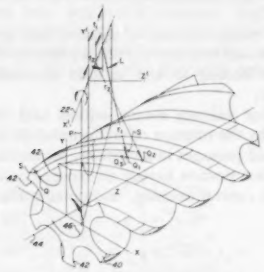
the relationship of said indicator element to said containment means being such that the application of tension to said tensile member causes an external force to be applied to said indicator element with the result that said indicator element is caused to be deformed thus presenting a change in optical appearance at said viewing area.

4,170,164

PROFILE CUTTER

Arvid L. Nelson, Quincy, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Division of Ser. No. 781,614, Mar. 28, 1977, Pat. No. 4,102,583.
This application May 1, 1978, Ser. No. 901,556
Int. Cl.[2] B27F *1/00;* B26D *1/12*
U.S. Cl. 409—13 4 Claims



1. A method for forming an article to have a plurality of helical flutes or grooves disposed spaced apart about the circumference of said article, said flutes having a common profile measured in a plane perpendicular to a longitudinal central axis of rotation of said article, said method including:

providing a rotary cutter having a cutter body adapted to be rotated about a cutter axis, said cutter including a plurality of cutting blades spaced apart along a helical line with respect to said cutter axis and forming only one turn of the helix;

providing each blade with a cutting edge the contour of which is different from the contour of every other cutting edge and is characterized by a series of points each of which at a particular angular position of said blade with respect to the axis of rotation of said cutter corresponds to the position of a point on the profile of said flutes with respect to the axis of rotation of said cutter whereby all points comprising the profile of said flutes will be cut by each blade of said cutter; and,

advancing said cutter with respect to said article in a direction parallel to said central axis of said article while rotating said article and said cutter in such timed relationship, one to the other, that all flutes on said article are formed in one pass of said cutter along said central axis of said article.

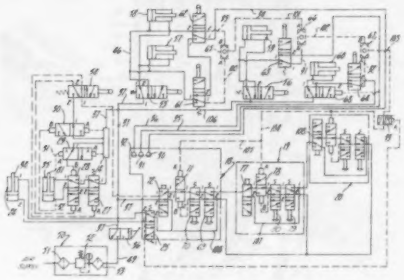
4,170,165

SYSTEM FOR OPERATION OF GAS CONTROLLED DEVICES EMBODYING AN AUTOMATIC PROGRAMMABLE VALUE SEQUENCER ADAPTED TO CEASE OPERATION UPON THE OCCURRENCE OF A MALFUNCTION

Santiago A. Bascos, 3252 Dawson Dr., Warren, Mich. 48092

Filed Oct. 26, 1976, Ser. No. 735,193
Int. Cl.[2] F01B *25/26, 31/12*
U.S. Cl. 91—1 15 Claims

1. A system for operating gas controlled devices embodying an automatic programmable valve sequencer adapted to cease operation of said sequencer or said gas controlled devices upon the occurrence of a malfunction, said system including an automatic programmable valve sequencer including in combination a frame member, a valve manifold having at least a first cam valve and a second cam valve mounted on said frame member and being connected to an air supply by a primary conduit, a cam cylinder rotatably mounted adjacent said valve manifold for operating said cam valves, means to mount cam segments to said cam cylinder adjacent each of said cam valves at a predetermined number of positions around the periphery of said cylinder, reversible gas operated means to advance said cylinder through each position of said cylinder, gas operated means to automatically index said cylinder through a predetermined number of positions of said cylinder when programmed to do so, means to program said automatic indexing means, means to reverse the direction of said cam cylinder, said system further including operating means connected to the output of at least said second cam valve, and indicating and shut-off means connected to at least said cam valve to indicate that said operating means are operating correctly and for halting further operation of said valve sequencer and at least said operating means if said operating means are malfunctioning by stopping further operation of said reversible gas operated means, and said indicating means including at least one limit valve having



an inlet and a first and a second outlet with said limit valve inlet being connected to a conduit, said conduit also connected to a conduit connecting said second cam valve with the blind end of first and second cylinders, a first shuttle valve, a conduit connecting said first outlet of said limit valve with said shuttle valve, a conduit connected to the output of said shuttle valve, a dumping valve connected to said shuttle valve output conduit with said dumping valve having an outlet and a pilot end A, the outlet of said dumping valve being connected to a conduit, a conduit connecting said outlet of said dumping valve to the pilot end A of a third master operator valve, and a conduit connecting said second output of said limit valve to an indicating valve mounted in the master operator's box.

4,170,166

AIR MOTOR WITH EXPANSIBLE CHAMBER

John H. Reed, P.O. Box 321, Kermit, Tex. 79745

Filed May 31, 1977, Ser. No. 802,174
Int. Cl.[2] F01B *1/06*
U.S. Cl. 91—481 8 Claims

1. An air motor having a crankcase, a plurality of expansion chambers, a crankshaft, a rod assembly;

means journaling said crankshaft within said crankcase with a marginal end of the crankshaft extending from the crankcase to enable power to be delivered by the air motor;

each of said expansion chambers includes a cylinder affixed to said crankcase, a cylindrical bellows concentrically arranged within said cylinder, means by which a lower end of said bellows is affixed to the lower end of said cylinder to form an annular expansion chamber therebetween;

said rod assembly having one end thereof journaled to said crankshaft and the other end thereof affixed to the upper end of said bellows;

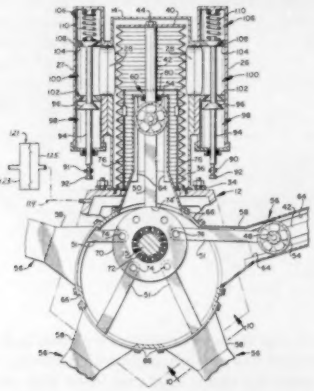
guide means by which a marginal outer end of said rod assembly is axially aligned respective to said bellows and cylinder;

said guide means includes a hollow, outwardly directed enclosure having a lower skirt member affixed to said crankcase in spaced relationship to the fixed end of the bellows, an upper end of said guide means extends into said bellows and includes an upper seal member thereon

which sealingly receives a marginal length of said rod assembly;

an intake and exhaust valve assembly connected to said annular expansion chamber, a valve actuator means connected to said crankshaft and to said intake and exhaust valve assembly for emitting air into said annular expansion chamber on the downstroke and exhausting air from said annular expansion chamber on the upstroke of said rod assembly;

said rod assembly includes a link rod and a bellows rod, one end of said link rod being affixed to said crankshaft, one end of said bellows rod being affixed to said bellows, the



other end of said link and bellows rods being journaled to one another;

said guide means includes a bearing member and a track; said link rod and bellows rod being connected together by said bearing member, said bearing member rides in said track with the track being disposed parallel to the axial centerline of said cylinder so that reciprocatory motion of the bellows rod imparts oscillatory motion into one end of said link rod;

so that the interior of the crankcase is separated from the interior of the bellows by said housing and seal member, with there being an isolated chamber formed between said expansion chamber and said crankcase.

4,170,167

GAS POWERED MOTOR AND SYSTEM

John H. Breisch, Lakewood, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 651,548, Jan. 22, 1976, Pat. No. 4,085,590, which is a continuation-in-part of Ser. No. 633,425, Nov. 19, 1975, abandoned, which is a division of Ser. No. 483,575, Jun. 27, 1974, Pat. No. 3,981,229, which is a continuation-in-part of Ser. No. 378,334, Jul. 11, 1973, abandoned, which is a division of Ser. No. 173,832, Aug. 23, 1971, abandoned. This application Dec. 21, 1977, Ser. No. 862,753

Int. Cl.[2] F01B *1/06*

U.S. Cl. 91—491 **6 Claims**

1. A radial motor adapted to be powered by a source of pressurized gas comprising:

a unitary cylinder block having a hub portion generally concentric with an axis and defining a central opening, a plurality of hollow cylinder portions extending radially outward from said hub portion and a closed axial end face portion at one side of said hub portion, said end face portion having a valve drive opening extending therethrough;

means for closing the tops of said cylinder portions;

a piston in each cylinder portion;

a master rod member having a central bore disposed in said central opening and connecting rod means securing said pistons to said master rod member whereby said master rod member orbits in a circular path about said axis as said pistons move within said cylinders;

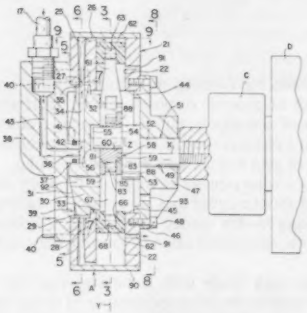
a support member at the opposite side of said hub portion of said block, said support member having a bore extending therethrough;

a crankshaft having one end journaled in said bore portion of said support member and is opposite end extending through and journaled in said bore of said master rod member;

backplate means secured to said end face portion and defining with said end face portion a plurality of passages, each passage leading to and in fluid communication with a cylinder;

commutator valving means within said backplate means driven by the rotation of said crankshaft to close and then open said passages in a circular, sequential manner;

said end face portion having an exposed outer surface opposite said central opening, said outer surface having a plu-



rality of recessed channels formed therein, each channel extending radially outwardly to the top of a cylindrical portion from a point on a circle concentric with said valve drive opening;

said backplate means including a spider plate adapted to be mounted in sealing engagement with said outer surface, said spider plate having a base portion and a plurality of leg portions spaced in equal circular increments about said base portion extending radially outwardly to a distance equal to the periphery of said unitary cylinder block, said spider plate having a central drive opening concentric with and equal to said drive valve opening, said spider plate further having a plurality of axial feed passages extending therethrough and spaced equally about a circle concentric with said central drive opening, said spider plate additionally having a plurality of ribs extending from one side of said spider plate, each rib extending from an axial inlet opening radially outwardly to the end of a leg portion, each rib adapted to be sealed in a channel to define said passages.

4,170,168

LOADER/BACKHOE HYDRAULIC SYSTEM AND CONTROL VALVE ASSEMBLY THEREFOR

Kenneth E. Jenkins, Peoria, Ill., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

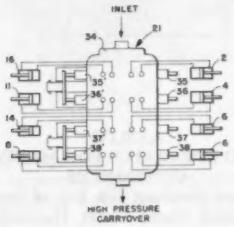
Continuation of Ser. No. 703,105, Jul. 6, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 921,205

Int. Cl.[2] F15B *11/16, 15/26*

U.S. Cl. 91—522 **2 Claims**

1. A valve assembly for a loader/backhoe having loader boom and bucket fluid motors and backhoe bucket, boom, dipper, swing and stabilizer fluid motors comprising a housing having inlet, return, and pairs of motor passages respectively adapted to be communicated with a fluid pressure source, a

tank, and said motors; selector valve members movable in said housing from a position communicating the pairs of loader boom and bucket and stabilizer motor passages with respective pairs of fluid passages in said housing to a position communicating the backhoe bucket, boom, dipper and swing motor passages with said respective pairs of fluid passages; directional control valve members upstream of the respective selector valve members movable in said housing to selectively communicate the passages constituting the respective pairs of fluid passages with said inlet and return passages; dual operating means at spaced apart locations remote from said housing for moving each directional control valve member as aforesaid from one location or the other; the operating means for the



control of the loader boom and bucket motors being adjacent to one another and the operating means for the control of the backhoe bucket, boom, dipper, swing, and stabilizer motors being adjacent to one another; first means providing for simultaneous movement of two of said selector valve members so that the associated directional control valve members control operation of said loader boom and bucket motors or of two of said backhoe bucket, boom, boom, dipper and swing motor; and second means providing for simultaneous movement of two other selector valve members; said two other selector valve members in the aforesaid positions and associated directional control valve members controlling operation of two stabilizer motors or of the remaining two of said backhoe bucket, boom, dipper and swing motors.

4,170,169

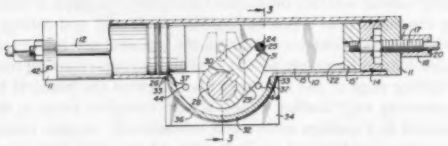
PISTON OPERATOR FOR IMPARTING ROTARY MOTION

Homer J. Shafer, 2300 Park Ave. West, Mansfield, Ohio 44906

Continuation-in-part of Ser. No. 707,720, Jul. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,096, Sep. 19, 1975, abandoned. This application Jan. 9, 1978, Ser. No. 867,797

Int. Cl.[2] F01B *9/00;* **F16J** *11/02*

U.S. Cl. 92—130 R **10 Claims**



1. A linear piston operator for a rotary valve having a single cylinder, a piston in said cylinder, a connector bar connected to said piston, a rotary valve stem member extending transversely and substantially tangentaially of said cylinder, said cylinder having a longitudinal slot adjacent said valve stem, an oscillatable element operatively connecting said connector bar to said valve stem member and extending through said slot during oscillation, a housing partially surrounding said stem member and bridging over the slot and having its ends welded to the cylinder at the ends of said slot, said housing having two longitudinal side bar portions welded to the cylinder along the sides of said slot, said side bar portions extending laterally from their weldments a substantial distance into said cylinder to increase reinforcement thereof.

4,170,170

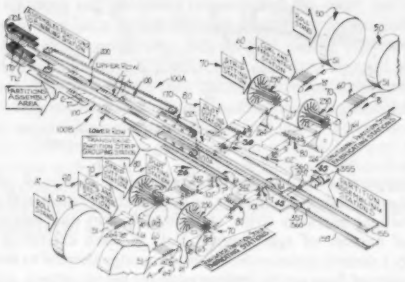
APPARATUS FOR FABRICATING AND ASSEMBLING MULTI-CELL PARTITIONS

Marion W. Beasley, Bishopville; Dale R. Swenson, Hartsville; Sidney E. Moore, McBee; Hurley R. Brooking, Hartsville, and Harlan L. Carroll, Cassatt, all of S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Nov. 29, 1977, Ser. No. 855,711

Int. Cl.[2] B31D *3/04*

U.S. Cl. 93—37 R **35 Claims**



1. Apparatus for successively fabricating and assembling multi-cell partitions having a plurality of intermeshing slotted transverse and longitudinal strips for use in cartons, crates and the like, said apparatus being characterized by a construction providing for substantially continuous movement of the partition strips, assembly of the partition strips in a collapsed condition and adjustability thereof for fabrication and assembly of varying sizes and types of partitions to provide desired speed and versatility for commercial operation, said apparatus comprising:

adjustable means for continuously fabricating elongate transverse and longitudinal partition strips from a continuous length of material of desired width, such as paper board, into individual strips of desired height having a desired number of spaced-apart slots in each extending inwardly a desired distance from an edge thereof to define a desired number of flaps on the edge; and

partition assembling means including an elongate horizontally extending guide means defining a plurality of longitudinally and horizontally extending vertically spaced parallel grooved trackways in respective opposite sides thereof for respectively receiving the slotted edges of the transverse and longitudinal partition strips therein at a receiving end thereof, said trackways corresponding in number and position to the desired intermeshing relationship of the longitudinal and transverse partition strips when assembled into a partition in collapsed intermeshing relationship, elongate cam means movably positioned interiorly within certain of said trackways of said guide means so that the grooves in said trackways extend inwardly from the opposite outer edges of said guide means at a converging intermeshing predetermined angle from the end of said guide means receiving the partition strips to the other end thereof, and means for continuously feeding the transverse and longitudinal strips along said cam means and within said trackways from the receiving end to the remote end of said guide means for converging and intermeshing the slotted partition strips for assembling partitions in collapsed condition, and adjustment means for said cam means for longitudinally moving said cam means within said guide means for varying the longitudinal position thereof and thus the depth of said trackways

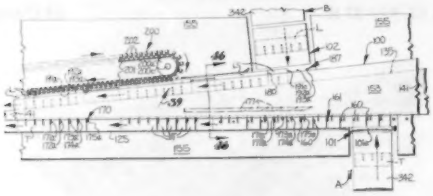
along said guide means for assembling various sizes and types of partitions.

4,170,171

APPARATUS FOR ASSEMBLING MULTI-CELL PARTITIONS

Marion W. Beasley, Bishopville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Nov. 29, 1977, Ser. No. 855,713
Int. Cl.[2] B31D *3/04*
U.S. Cl. 93—37 R **16 Claims**



1. Apparatus for successively assembling multi-cell partitions having a desired number of intermeshing transverse and longitudinal partition strips of desired height and having a desired number of spaced-apart slots in each extending inwardly a desired distance from a leading edge thereof to define a plurality of flaps on the leading edge for use in cartons, crates and the like, said apparatus being characterized by construction providing for substantially continuous movement of the partition strips during assembly, assembly of the partitions in collapsed condition capable of being erected for subsequent use as a partition and adjustability thereof for assembly of varying sizes and types of partitions to provide desired speed and versatility for commercial operation, said apparatus comprising:

an elongate guide member positioned for successively receiving the leading slotted ends of the transverse and longitudinal partition strips on the respective opposite sides at one end thereof and extending generally horizontally and longitudinally from the receiving end to a remote other end;

a plurality of longitudinally and horizontally extending vertically spaced parallel trackway openings in one side of said guide member extending a predetermined distance inwardly of said guide member;

a plurality of longitudinally and horizontally extending vertically spaced trackway slots in the other side of said guide member extending through said guide member to the one side thereof in parallel alternating vertically staggered intermeshing relationship to said trackway openings;

elongate cam means of less longitudinal length than said guide member movably positioned interiorly within said trackway slots to extend from said receiving end toward said remote end of said guide member for defining open portions in said trackway slots extending inwardly from the other side of said guide member at an increasingly converging intermeshing predetermined angle to said trackway openings from said receiving end toward said remote end of said guide member;

means for successively positioning a series of the transverse partition strips with successive flaps thereof into successive vertically spaced trackway openings at said receiving end of said guide member;

means for successively positioning a series of the longitudinal partition strips with all of the flaps thereof into successive vertically spaced trackway slots at said receiving end of said guide member;

continuous feeding means for successively engaging the transverse and longitudinal strips positioned in said receiving end of said guide member and for continuously moving the strips longitudinally along said guide member and said cam means to said remote end thereof while separating a predetermined number of the strips into opposing groups of longitudinally-staggered strips and aligning the slots of the strips of the opposing groups so that the opposing groups of strips will converge and intermesh as they are fed along said guide member for assembling partitions; and

adjustment means for said cam means for longitudinally moving said cam means within said guide means for varying the longitudinal position thereof and thus the depth of said slots along said guide member for assembling various sizes and types of partitions.

4,170,172

METHOD AND APPARATUS FOR MAKING ROLLED CONTAINERS

Fritz Wommelsdorf, Hamburg, Fed. Rep. of Germany, assignor to Maschinenfabrik Rissen GmbH, Hamburg, Fed. Rep. of Germany

Filed Oct. 18, 1977, Ser. No. 843,245
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2650097
Int. Cl.[2] B31C *7/02*
U.S. Cl. 93—94 FC **4 Claims**

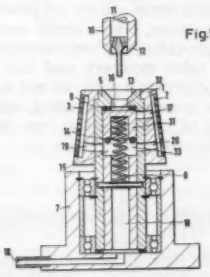


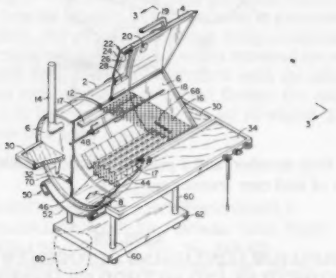
Fig.5

1. In a method of rolling a paper-like container blank into a rolled tubular container part on a rotating mandrel and with the tubular container port having inner and outer angularly overlapping edge portions, and sealing the overlapping edge portions together to form a container tube seam therewith, the improvement wherein the method comprises the steps of rotating the mandrel at a first rolling station thereof and rolling a said paper-like container blank on the mandrel and into a said rolled tubular container part by initially vacuum retaining only a leading edge of the container blank against the mandrel by connecting only leading edge vacuum retention ports in the mandrel to a vacuum source and subsequently vacuum retaining only an additional trailing edge of the container blank against the mandrel after the container blank is rolled thereon into said rolled tubular container part by additionally connecting only trailing edge vacuum retention ports in the mandrel to a vacuum source and whereupon said rolled tubular container part is retained in the mandrel by vacuum retention of only its leading and trailing edges, and, with the rolled tubular container part retained on the mandrel by such vacuum retention of only the leading and trailing edges thereof, indexing the mandrel to a sealing station and sealing the overlapping edge portions of the rolled container part together to form a said container tube seam.

4,170,173
BARBECUE

Lovell O. Bradford, 3671 Elston Dr., San Bruno, Calif. 94066

Filed Dec. 23, 1977, Ser. No. 864,128
Int. Cl.[2] A47J 37/04
U.S. Cl. 99—341 12 Claims



1. A barbecue comprising:

a housing for supporting a grill or a spit above a heat source, the housing having a plurality of vents in its lower portion;

means defining an open-ended trough beneath the housing or catching water and ashes flowing from the housing through the vents when the interior of the housing is washed and for permitting the water and ashes to pass out an open end of the trough, the trough having a bottom and a pair of spaced upper edges, the upper edges being disposed at an elevation at least as high as the highest of the plurality of vents;

means for spacing the housing and the bottom of the trough apart;

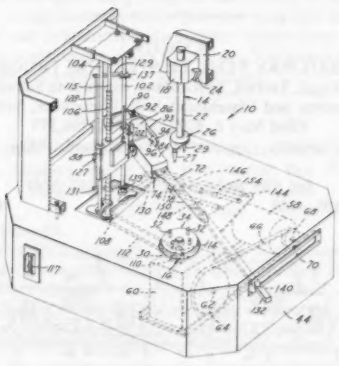
means for supporting the housing, the trough, and the spacing means; and

means for holding the housing, the trough, the spacing means, and the supporting means rigidly together.

4,170,174
SPIRAL MEAT SLICER

Allan V. Ditty, 20644 Maple La., and William B. Shaffer, 1761 Hampton, both of Grosse Pointe Woods, Mich. 48236

Filed Oct. 26, 1977, Ser. No. 845,645
Int. Cl.[2] A23N 23/00, 7/00
U.S. Cl. 99—538 5 Claims

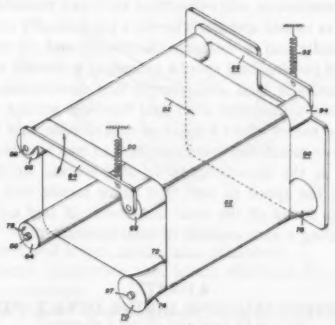


1. A spiral meat slicer for forming a continuous spiral slice on a cut of meat having an irregularly shaped bone extending therein comprising means for mounting the meat with the bone as a substantially vertical axis about which to rotate the meat, a vertically movable carriage, a horizontally pivotable support structure pivotably mounted on said carriage, a knife for slicing the meat mounted on said support structure, said knife being positioned with respect to the axis of rotation of the bone to enable a spiral cut to be made in the meat, means for longitudinally reciprocating the knife against the meat, means for rotating the meat, means for relatively moving said carriage vertically with respect to the meat to advance the knife along the axis of rotation of the meat to form a continuous spiral slice in the meat, lever means for moving the knife into slicing engagement with the meat, resilient means interconnecting said lever means with said support structure to yieldingly maintain the knife in contact with the meat bone, a rigid elongated element interconnecting said lever means with said support structure, said rigid element being pivotably connected at one end to one of said lever means and said support structure and slidingly and pivotably connected at the other end to the other of said lever means and said support structure, said sliding connection permitting only limited sliding movement to accomodate variations in bone size, said rigid element including adjustment means to vary the length thereof, said means for relatively moving said carriage vertically with respect to the meat comprising a substantially vertical power driven worm, a freely rotatable worm gear mounted on said carriage in engagement with the worm, said worm having a reduced diameter unthreaded portion proximate the upper end thereof for limiting the extent of upward movement of said carriage after completion of a spiral cut.

4,170,175
BELT TRACKING SYSTEM

Bartholomew F. Conlon, Jr., Waynesboro, Va., assignor to General Electric Company, Waynesboro, Va.

Filed Mar. 24, 1978, Ser. No. 889,890
Int. Cl.[2] B65H 23/16, 23/26; F16H 7/18
U.S. Cl. 101—1 8 Claims



1. A system for driving an endless belt within a confined area, comprising a system of rollers supporting said belt, a first of said rollers being a substantially cylindrical drive roller, a second of said rollers being substantially cylindrical over a central major portion thereof substantially corresponding to the width of said belt and flaring outwardly with increasing diameter at each end thereof, said first and second rollers being mounted to rotate about fixed parallel axes, a third of said rollers being rotationally mounted at each end thereof in one end of a respective support arm, said support arms being arranged to pivot about an axis parallel to said fixed parallel axes and being biased such as to maintain uniform tension in said belt and to maintain all of said axes normally substantially parallel to each other, said flared roller and said support arms operative when said belt creeps toward one end of said flared roller to cause the belt edge closest to that end to climb to a larger diameter of said flared roller thereby pulling inwardly on the corresponding end of said third roller and, due to the consequent pivotal movement of the corresponding support

arm, causing said third roller to tilt out of parallelism which, in turn, causes said belt to move laterally toward the other end of said rollers until said belt is again centered and the parallelism of said rollers is restored.

4,170,176

PRINTING MECHANISM WITH DRIVE FOR AXIALLY MOVABLE DISTRIBUTING ROLLER

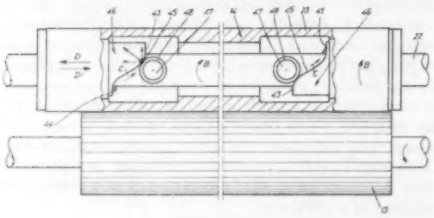
Marcel Domeniconi, Porrentruy, Switzerland, assignor to Kurt G. Hinterkopf, Eislingen, Fils, Switzerland

Filed Sep. 9, 1977, Ser. No. 832,101

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658362

Int. Cl.[2] **B41F** *31/14;* **B41L** *27/16*

U.S. Cl. 101—330 **6 Claims**



1. A printing mechanism having a doctor roller, a distributing roller which can be moved axially back and forth and which cooperates with another roller for the color distribution, a press roller and a printing roller, the improvement comprising wherein said axially movably supported distributing roller has a hollow-cylindrical shell, an axially fixed spindle supporting said cylindrical shell for rotation and axial movement relative thereto, and at least one axially facing curved surface fixedly connected to said cylindrical shell and rotatable therewith relative to said spindle, wherein a pin is fixedly connected to said spindle and is rotatable therewith, said pin engaging said curved surface, said spindle extending generally coaxially of said cylindrical shell, and wherein first drive means effect a drive of said cylindrical shell and wherein second variable speed drive means effect a drive of said spindle, said first and second drive means being independent of one another so that variations in the driven speed of said second drive means relative to the speed of said first drive means will effect a variation in speed of the axial movement of said cylindrical shell including a zero amount of axial movement.

4,170,177

PRINTING MACHINE INKING DEVICE WITH PLURALITY OF CAM LEVERS

Mitsuhiko Iida, Zama; Yasuo Kato, Yokohama; Kazuyuki Baba, Zama, and Hideo Fujie, Shizuoka, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

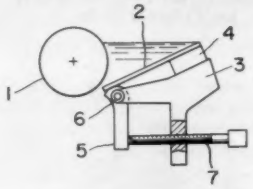
Filed Apr. 4, 1978, Ser. No. 893,464

Claims priority, application Japan, Apr. 7, 1977, 52/39826; Apr. 7, 1977, 52/39827; Apr. 7, 1977, 52/43369[U]; Feb. 6, 1978, 53/13500[U]

Int. Cl.[2] **B41F** *31/04, 31/18*

U.S. Cl. 101—365 **3 Claims**

1. An inking device of a printing machine comprising an inking roller, a plurality of cam levers disposed side by side and in contact with each other in the longitudinal direction of said inking roller, said cam levers being pivotably supported by a stationary member of said inking device, and a plurality of means for individually driving said cam levers so as to adjust the gap between the surface of said inking roller and the surfaces of said cam levers, each of said cam levers being made of a solid material and each of said driving means comprising an adjustable stop member provided with a notch at one end to receive a pin secured to the lower portion of each of said cam levers to control angular position thereof, means for adjusting



said stop member, and a piston-cylinder assembly for rotating each of said cam levers.

4,170,178

DETONATOR CONTAINING OCTOGEN CRYSTALS FOR PROJECTILES AND METHOD OF MANUFACTURING THE SAME

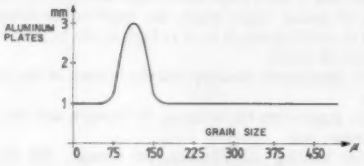
Günther Diewald, Zürich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle, Zurich, Switzerland

Filed Dec. 12, 1977, Ser. No. 859,647

Claims priority, application Switzerland, Dec. 21, 1976, 16081/76

Int. Cl.[2] **C06C** *7/00, 7/02*

U.S. Cl. 102—29 **7 Claims**



1. A detonator for projectiles for initiating or transmitting detonation, comprising:

an explosive charge of octogen containing a mixture of different sizes of octogen crystals including octogen crystals possessing a size greater than 75 microns and smaller than 150 microns;

the octogen crystals of such size having a ratio of the length to diameter of about 3:1 and essentially undamaged crystal edges.

4,170,179

RAILWAY VEHICLE STEERING TRUCK

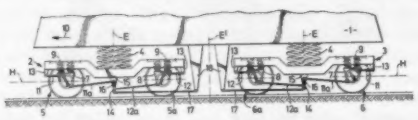
Hans H. Vogel, Tuttwil, Switzerland, assignor to Schweizerische Lokomotive- und Maschinenfabrik, Winterthur, Switzerland

Filed May 6, 1977, Ser. No. 794,377

Claims priority, application Switzerland, May 7, 1976, 5734/76

Int. Cl.[2] **B61F** *3/08, 5/20, 5/30, 5/44*

U.S. Cl. 105—168 **16 Claims**



1. A rail vehicle comprising

a vehicle body;

at least two trucks supporting said body and being movably mounted relative to said vehicle body;

at least two sets of wheels mounted in said trucks, each wheel set being rotatably mounted in a set of rotatably mounted lateral axle bearings;

at least one of said set of wheels of one truck being mounted for rotation about a vertical axis; and

a steering device for steering said one set of wheels of said one truck about said vertical axis, said steering device comprising at least two guide rods pivotally mounted on one axle bearing of said one set of wheels at diametrically offset points, one of said guide rods being connected to said one truck and a positioning means mounted on one of said vehicle body and said other truck with the other of said guide rods pivotally connected thereto for rotating said one axle bearing about said one set of wheels during negotiation of a track curve.

4,170,180

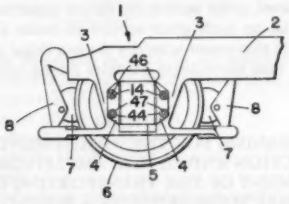
PEDESTAL WEAR LINER ASSEMBLY

Stanley M. Houston, 74 Scenic Dr., Orinda, Calif. 94563

Filed Nov. 7, 1977, Ser. No. 849,423

Int. Cl.[2] B61F *5/30, 5/50, 17/36;* **F16C** *33/20*

U.S. Cl. 105—225 **5 Claims**



1. A pedestal assembly for use in a railroad vehicle having a journal box which slides vertically between spaced-apart pedestal legs, said assembly comprising a channel-shaped elastomer structure having an outer wear face oriented to contact a journal box of a railroad truck when said assembly is mounted on a pedestal leg and an inner face enclosed by parallel upstanding flanges of said channel-shaped structure, said upstanding flanges having a plurality of apertures located remotely to said outer wear face, and a plurality of substantially rigid spacing washers, one of said spacing washers received in each aperture, each of said spacing washers having a cylindrical body connected to an annular flange, allowing its cylindrical body to be received in its associated aperture in one of said upstanding flanges so that the annular flange abuts on the outer surface of said upstanding flange so said washer is operable to limit the compression of said elastomer structure due to the length of said cylindrical body member which forms a stop to limit such compression when a mounting bolt forces said spacing washer inwardly against a pedestal leg.

4,170,181

TABLE SKIRTING AND DOUBLE-GRIP CLIP

Robert L. Glasgow, Rte. 1, Box 1100, Porter, Tex. 77365

Filed Nov. 26, 1976, Ser. No. 745,480

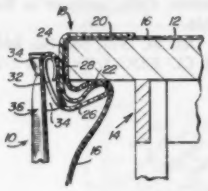
Int. Cl.[2] A47B *9/00*

U.S. Cl. 108—50 **3 Claims**

1. A table skirting system, comprising, in combination:

(a) a skirt arrangeable along a peripheral portion of a top of a table with which the skirt is to be associated;

(b) connector means for mounting the skirt on the table, the connector means including a clip and at least one pin, with the clip being engageable with the top of the table and with the skirt for attaching the skirt to the top of the table, and the pin being engageable with a cloth arranged covering the top of the table and with the skirt for mounting the skirt on the table, the skirt being provided with a pleat and with a facing attached to the skirt adjacent an edge thereof arrangeable immediately adjacent the top of the associated table, the pleat forming a crease dividing the facing into a plurality of pockets, the clip comprising a substantially U-shaped element having a pair of codirectionally extending legs and a web joining the legs, one of the legs being shorter than the other of the legs and terminating in an extension folded back toward and extended beyond the



one of the legs to a terminal end disposed adjacent to the web of the U-shaped element and terminating in a recess forming a bifurcated section of the clip including two codirectional fingers, the pockets partly forming the connector means and being arranged for removably receiving the fingers of the bifurcated section of the clip.

4,170,182

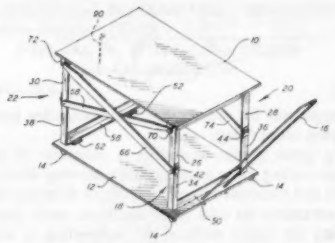
FOLDING TABLE STRUCTURE

Millard J. Button, 108 Fairmount Ave., Liverpool, N.Y. 13088

Filed Mar. 6, 1978, Ser. No. 883,713

Int. Cl.[2] F16M *13/00*

U.S. Cl. 108—106 **10 Claims**



1. A folding structure comprising:

(a) upper and lower rectangular platforms;

(b) wheels supporting said lower platform for movement over a surface;

(c) four legs of equal length each hingedly movable at one end about first axes substantially in the plane of the upper side of said lower platform and hingedly movable at the other end about second axes, parallel to said first axes and substantially in the plane of the lower side of said upper platform;

(d) each of said legs being divided intermediate of their ends into upper and lower sections connected for folding movement about axes parallel to both said first and second axes between erected positions, wherein said upper and lower sections are linearly arranged end-to-end, and folded positions, wherein said upper and lower sections are substantially superposed along their lengths;

(e) first and second pairs of lateral support members each attached at one end for pivotal movement about a pair of third axes, near said second axes; and

(f) coupling means for releasably attaching the other end of each of said lateral supports to the leg on the same side and opposite end of the structure at which said one end of the lateral support is pivotally attached, said coupling means including structure for releasably engaging both of said

upper and lower sections, thereby maintaining said upper and lower leg sections in said erected position thereof.

4,170,183

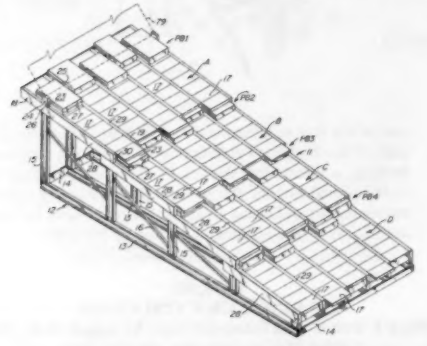
INCINERATING METHOD AND APPARATUS HAVING SELECTIVE, CONTROLLED MOVEMENT OF MATERIALS DURING COMBUSTION

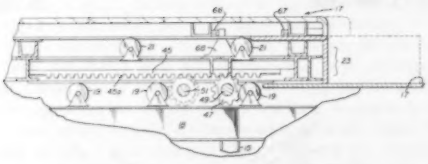
John F. Cross, Denver, Colo., assignor to Energy Generation, Inc., Denver, Colo.

Filed Oct. 20, 1977, Ser. No. 844,029

Int. Cl.[2] F23G *5/00*; F22B *1/22*

U.S. Cl. 110—268 **28 Claims**





1. In apparatus for incinerating a combustible material, the combination comprising:

moving grate means including a plurality of juxtaposed reciprocating grate sections each moving alternately forward and backward in relation to the direction of material advancement on said grate sections, each grate section having an upper surface for supporting a combustible material during combustion, said upper surface being inclined downwardly in the direction of material advancement from an inlet end to an outlet end for each of said grate sections;

reciprocating pushing means including a pushing member at the inlet end of each of said grate sections for successively moving forwardly over the downwardly inclined upper surface of each grate section a distance substantially less than the full length of each upper surface of each grate section between the inlet end and the outlet end to advance the material along each grate section by forces imparted through the material on each grate section in a forward stroke and moving backward in a back stroke after each forward stroke leaving a void in the material on each grate section; and

means for filling said void after each back stroke with incoming material that is advanced by the next forward stroke of each pushing member which in turn advances the previously advanced material further along the upper surface of the associated grate section by forces imparted through the material on each grate section to cause a selective particle movement whereby less dense particles travel faster than more dense particles during the combustion of said particles.

23. In a method of incinerating a combustible material including a plurality of adjacent reciprocally movable grate sections for supporting a combustible material during combustion, said grate sections being inclined downwardly in the direction of material advancement from an inlet end to an outlet end for each of said grate sections, a reciprocally movable pushing member at the inlet end of each of said grate sections, and means for feeding incoming material to the inlet end of said pushing members and grate sections, the steps of:

moving said grate sections alternately back and forth in relation to the direction of material advancement from the inlet end to the outlet end of each of said grate sections;

successively moving each of said pushing members forwardly over the downwardly inclined upper surface of each of said grate sections a distance substantially less than the full length of each upper surface of each grate section between an inlet end and an outlet end to advance the material along each grate section by forces imparted through the material on each grate section in a forward stroke and moving backward in a back stroke after each forward stroke leaving a void in the material on each grate section; and

filling said void after each back stroke with incoming material that is advanced by the next forward stroke of each pushing member which in turn advances the previously advanced material further along the upper surface of the associated grate section by forces imparted through the material on each grate section to cause a selectivity of particle movement whereby the less dense particles travel faster than more dense particles during combustion.

4,170,184

MECHANISM FOR THE ADJUSTMENT OF THE DIRECTION AND OF THE AMPLITUDE OF THE MOVEMENT OF THE TRANSPORTING CLAW FOR MATERIAL TO BE SEWN ON A SEWING MACHINE

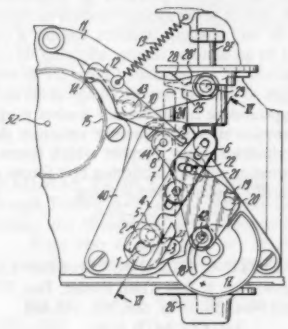
Marcel Fresard, Petit-Lancy, and Norbert Raboud, Aire-Geneva, both of Switzerland, assignors to Mefina S.A., Fribourg, Switzerland

Filed Dec. 21, 1977, Ser. No. 862,982

Claims priority, application Switzerland, Dec. 28, 1976, 16371/76

Int. Cl.[2] D05B *27/00*

U.S. Cl. 112—317 **11 Claims**



1. A mechanism for controlling the direction and the amplitude of the movement of a transporting claw guide for material to be sewn on a sewing maching, comprising a shaft connected at one end to the mechanism of the transporting claw guide, a cam, driven by a main driving shaft of the machine, and acting via a series of intermediate members, connected to the other end of the shaft, wherein, the series of intermediate members comprises a first lever, one end of which is provided with a follower in contact with a surface of the cam, a reversing lever in contact with the other end of the first lever, a second lever for rotating the oscillating shaft and mounted on the reversing lever in a longitudinally displaceable manner, a bearing mem-

ber disposed on the end of the oscillating shaft opposite to the end connected to the mechanism of the transporting claw guide, and in contact with one end of the second lever, and a third lever connecting the second lever to a control member for the longitudinal displacement of the second lever, to adjust the position of its end in contact with the bearing member

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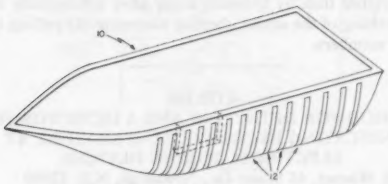
4,170,185

PREVENTING MARINE FOULING

Preston V. Murphy, Geneva, Switzerland, and Mireille J. Latour, Montpellier, France, assignors to Lectret S.A., Geneva, Switzerland

Filed Jan. 9, 1978, Ser. No. 867,676
Int. Cl.[2] B63B *59/02*
U.S. Cl. 114—222 **6 Claims**



1. A body for immersion in water in use which comprises:
a structural portion having an external area to be in contact with said water in use,
a piezofilm layer of substantial area,
a first electrode of substantial area,
a second electrode of substantial area, and
a power supply,
said first and second electrodes being in sandwich relation with said piezolayer therebetween, and
said piezofilm layer, said first electrode, said second electrode, and said structure being integrally joined in the thickness direction of said piezofilm layer,
whereby electrical change from said power supply vibrates said piezofilm layer over said entire area thereof in width, length and thickness directions, to provide antifouling at low expenditure of energy.

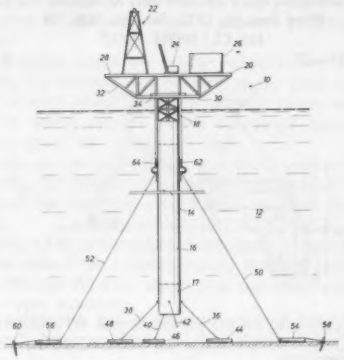
4,170,186

ANCHORED OFFSHORE STRUCTURE WITH SWAY CONTROL APPARATUS

Clarence W. Shaw, Metairie, La., assignor to J. Ray McDermott & Co., Inc., New Orleans, La.

Continuation of Ser. No. 698,260, Jun. 21, 1976, abandoned.
This application Nov. 17, 1977, Ser. No. 852,292
Int. Cl.[2] B63B *21/52, 51/02*
U.S. Cl. 114—264 **10 Claims**

1. An offshore structure for placement in a body of water comprising:
an elongate member for disposition in a body of water to extend above and below the surface of the water, said member being anchored to the ocean floor to permit tilting;
a plurality of guy lines radially arranged around said elongate member in connecting between said member and anchors of the ocean floor;
sway control apparatus operably connected to each of said guy lines for altering the length of said lines between said elongate member and said anchors in response to tilting of said elongate member;
said sway control apparatus includes first and second winch means;
said first winch means includes a first group of reels mounted on a common drive shaft which connects to a first group of guy lines and tilts said elongate structure along one direction by pulling in and letting out said first group of guy lines; and
said second winch means includes a second group of reels mounted on a common drive shaft which connects to a second group of guy lines and tilts said elongate structure



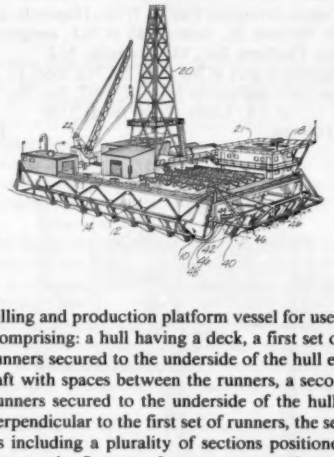
along another direction at a right angle to said one direction by pulling in and letting out said second group of guy lines.

4,170,187

ARCTIC DRILLING AND PRODUCTION PLATFORM

Joseph F. Schirtzinger, Pasadena, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.

Filed Jan. 26, 1978, Ser. No. 872,609
Int. Cl.[2] B63B *35/44*
U.S. Cl. 114—264 **7 Claims**



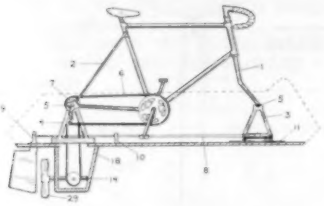
1. A drilling and production platform vessel for use in arctic regions, comprising: a hull having a deck, a first set of spaced parallel runners secured to the underside of the hull extending fore and aft with spaces between the runners, a second set of parallel runners secured to the underside of the hull and extending perpendicular to the first set of runners, the second set of runners including a plurality of sections positioned in the spaces between the first set of runners, means for moving at least one set of runners vertically relative to the other set of runners, whereby the weight of the hull can be transferred from one set of runners to the other by raising and lowering the one set of runners to a position above or below the other set, and means including a plurality of rotating ice cutters mounted on the hull, said ice cutters being positioned to cut grooves in the ice in front of both sets of runners for cutting channels in the ice in which the runners move and support the hull.

4,170,188

AQUATIC DEVICE ATTACHABLE TO A TWO-WHEELED VEHICLE

Joseph L. Jamison, Jr., P.O. Box 607, Arlington, Va. 22216

Filed Jun. 22, 1977, Ser. No. 808,798
Int. Cl.[2] B63H *16/12*
U.S. Cl. 115—27 **6 Claims**



1. An aquatic device attachable to and detachable from a tandem-wheeled vehicle with its wheels removed, the aquatic device comprising:

at least one hull;

a front fork housing and steerage swivel assembly;

said swivel assembly affixing to and supporting the front fork end bracket of the vehicle;

said swivel assembly being of swivel configuration and motivating a rudder through motivation of the vehicle's handlebars;

a rear axle drive assembly;

said assembly being comprised of a drive axle rotatable through a supporting structure which affixes to the rear fork end bracket of the vehicle;

said drive axle being motivated by an attached chain drive sprocket of a design derivative of that in use by the vehicle before removal of the vehicle's wheels;

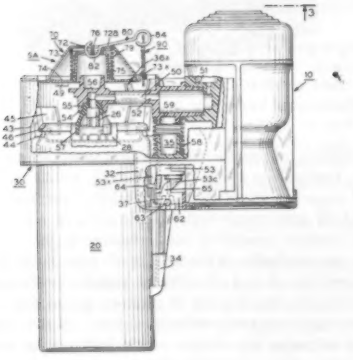
said drive axle, in turn, motivating an aquatic propulsive assembly culminating in a propeller.

4,170,189

SENSOR ELEMENT AND ASSEMBLY FOR THERMALLY RESPONSIVE APPARATUS

Michael Pappas, Irvington; Paul A. Witte, Hopewell, and Christopher N. Severud, Jr., Summit, all of N.J., assignors to Falcon Safety Products, Inc., Mountainside, N.J.

Continuation-in-part of Ser. No. 754,752, Dec. 27, 1976, abandoned. This application May 12, 1977, Ser. No. 796,157
Int. Cl.[2] G08B *17/00*; B67D *5/10*
U.S. Cl. 116—106 **11 Claims**



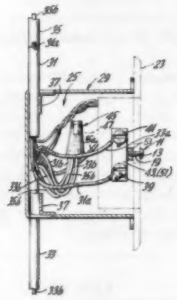
1. A heat sensitive unit responsive to a predetermined ambient temperature conditions requisite for activating fire alarm and extinguishing and heat-sensitive protective apparatus, comprising an assembly of two metal members having surfaces which overlap throughout an area, a thin layer of low melting point solder responsive to said conditions between said members within said area forming a joint between said members, at least one of said members being made of a metal which does not alloy significantly with said solder at conventional soldering temperatures while the solder is molten during the joining of said members, the bond which is created between said member and said solder at said temperatures being weaker than the solder strength in shear and tension, and means formed on each of said members for connecting them to a force less than the strength of said bond tending to pull them apart to activate the apparatus, the weakness of said bond in cooperation with heating of said solder as it reaches its melting point at said predetermined ambient temperature causing the pulling apart of said plates to occur by breaking away of said bond at the interface of said solder layer with at least one of said members after partial melting of the solder rather than by breaking away after substantially complete melting of the solder, thereby hastening the pulling apart of said members.

4,170,190

METHOD FOR DETECTING AND A DETECTOR FOR INDICATING EXCESSIVE TEMPERATURE AT ELECTRICAL WIRING DEVICES

John H. Warner, 44 Susan Dr., Newburgh, N.Y. 12550

Filed Apr. 4, 1978, Ser. No. 893,495
Int. Cl.[2] G01K *11/12*
U.S. Cl. 116—206 **14 Claims**



1. A detector for indicating excessive temperature at electrical wiring devices enclosed by a cover plate, comprising:

a metallic cylindrical threaded shank adapted for threaded engagement with the electrical wiring device;

a head means having an inner surface and an exterior surface, said inner surface being rigidly mounted on said metallic cylindrical threaded shank, said head means having a recess therein generally centrally located across its exterior surface for engaging the head means to turn the metallic cylindrical shank into the electrical wiring device, said inner surface being adapted to secure the cover plate over the electrical wiring device; and

a film adhered to the exterior surface of said head means, said film being adapted to change color a predetermined temperature.

4,170,191

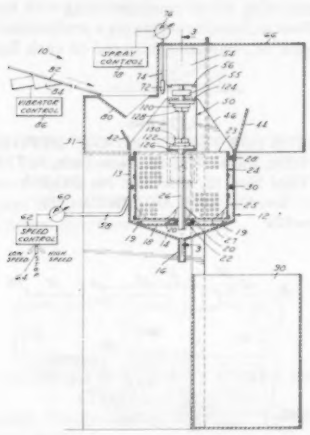
AUTOMATIC COATING AND SPIN DRYING APPARATUS

Robert J. Juve, 34623 Moravian Dr., Sterling Heights, Mich. 48077

Filed Jul. 27, 1977, Ser. No. 819,231
Int. Cl.[2] B05C *5/00, 11/08*
U.S. Cl. 118—705 **8 Claims**

1. Automatic coating and drying apparatus comprising a basket having a basket axis, an open end and perforated side

walls; means including drive means mounting said basket to spin about said basket axis; means mounting said basket to rotate about an axis transverse to said basket axis between a first position in which said basket open end is directed upwardly and a second position in which said basket open end is directed generally downwardly; means disposed above said open basket end in said first position of said basket for directing a steady stream of elements into said basket; spin drive means including means for spinning said basket at a low first speed as said element stream is being directed into said basket such that said elements are evenly distributed within said basket about said basket axis and for spinning said basket at a higher second speed when said basket is full centrifugally to dry said elements; means including a nozzle disposed above said open basket end in said first position of said basket to spray solution onto said elements as said element stream is directed into said basket; and control means coupled to said spray means, said spin drive means, said element stream directing means and said basket rotating means to activate said stream directing means, said spray means and said spin drive means at low speed simultaneously to distribute and spray elements as elements are loaded into said basket when said basket is in said first basket position, to activate said spin drive means at high speed to dry elements loaded into said basket, to rotate said basket to said second basket position to empty dried elements from said basket, and then to rotate said basket back to said first basket position.



4,170,192

APPARATUS FOR SUPPLYING FLUID MEDIA TO THE INTERNAL SURFACE OF A TUBULAR WORKPIECE

Paul T. Maddock, 1614-13 St. North, Lethbridge, Alberta, Canada

Filed Jan. 19, 1977, Ser. No. 760,755

Claims priority, application United Kingdom, Apr. 22, 1976, 16365/76

Int. Cl.[2] **B05C** *7/02*

U.S. Cl. 118—306 **8 Claims**

1. In a fluid supply apparatus for supplying fluid media for use at the internal surface of a tubular workpiece, the improvement comprising:

adjustable frame means which is movable along the inside of the tubular workpiece;

a tubular housing nonrotatably mounted on the frame means;

at least two rigidly connected coaxially arranged fluid supply pipes mounted for rotation within the housing and having open inlet ends and closed outlet ends, with the inlet ends of the rotatable supply pipes being of progressively increasing diameter as disposed progressively downstream of the inlet end of the inner rotatable supply pipe;

rotary seals carried by the housing and respectively engaging the inlet ends of the rotatable supply pipes to isolate a chamber between said radially adjacent rotatable supply pipes;

driving means which are wholly supported on the frame means for rotating the rotatable supply pipes in unison, said driving means including rotatable motor means and geared speed reducer means connected between said motor means and said supply pipes;

a plurality of nonrotatable supply conduits connected to the housing for respectively communicating with the inlet ends of the rotatable supply pipes adjacent said rotary seals;

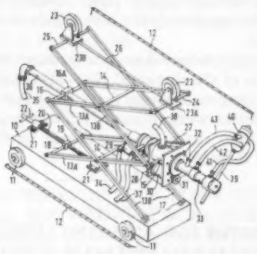
a plurality of branch conduits respectively connected to the outlet ends of the rotatable supply pipes for communication through the inner supply pipe and said chamber with the supply conduits;

support means for supporting the outlets of the branch conduits adjacent the internal surface of the tubular workpiece;

mounting means provided on the frame means for engagement with the inside of the tubular workpiece to facilitate movement of the frame means along the inside of the workpiece;

said frame means comprising two tong mechanisms pivotally connected together in series;

said two tong mechanisms each having at least two pairs of intersecting tong members which are pivotally connected to each other at the intersection point and extend symmetrically on opposite sides of a radial plane through the rotational axis of the rotatable fluid supply pipes; and



means engageable with at least one of the tong mechanisms for articulating the intersecting members of the tong mechanisms so as to vary the width of the frame means transversely of the rotational axis of the rotatable supply pipes.

7. In an apparatus movable along the interior of an elongated tubular workpiece for supplying and discharging fluid media against the internal surface of said workpiece, the improvement comprising:

adjustable frame means which is movable along the inside of said tubular workpiece in the longitudinal direction thereof, said frame means being adjustable transversely to accommodate workpieces of different cross-sectional dimensions;

said frame means including a pair of substantially identical scissor mechanisms which are pivotally connected in series transversely relative to said longitudinal direction, each scissor mechanism including at least two pairs of sidewardly displaced intersecting elongated elements which are pivotally connected at their points of intersection, said points of intersection being disposed intermediate the ends of said elongated elements, the elongated elements at their inner ends as associated with one scissor mechanism being pivotally connected to the inner ends of the elongated elements associated with the other scissor

mechanism, and a pair of cross members connected to and extending between the pairs of elongated elements at the pivotally connected inner ends of said pair of scissor mechanisms;

nonrotatable tubular housing means fixedly secured to one of said cross members and projecting in the longitudinal direction of said workpiece;

at least two rigidly connected coaxially arranged fluid supply pipes mounted for rotation within said tubular housing means, said fluid supply pipes having open inlet ends and closed outlet ends, the latter ends projecting forwardly of said housing means;

rotary seal means cooperating between said housing means and said rotatable supply pipes to define a first fluid supply passage through the inner supply pipe and to define an annular fluid supply chamber defined between said housing and said inner supply pipe adjacent the inlet end of the outer supply pipe for permitting a fluid to be supplied through the latter;

drive means supported on said housing means for rotating said supply pipes in unison;

a plurality of nonrotatable supply conduits connected to said housing means for respectively communicating with the inlet ends of the rotatable supply pipes adjacent said rotary seal means;

a plurality of outlet conduits respectively connected to the outlet ends of the rotatable supply pipes for communication through the inner supply pipe and said chamber with the respective supply conduits;

support means disposed adjacent the internal surface of the tubular workpiece and fixedly connected to and rotatable with one of said supply pipes adjacent the outlet end thereof for supporting the outlet ends of said outlet conduits; and

engaging means mounted on said frame means adjacent the outer ends of the elongated elements associated with said pair of scissor mechanisms for engagement with the inside of the tubular workpiece to facilitate movement of said frame means along the workpiece in the longitudinal direction thereof.

4,170,193

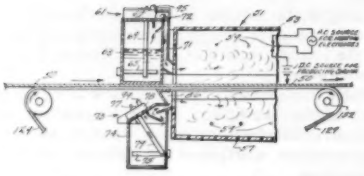
APPARATUS FOR APPLYING LUBRICATING MATERIALS TO METALLIC SUBSTRATES

Addison B. Scholes, Muncie, Ind.; David L. Dollar, Greeneville, Tenn., and Robert L. Hurst, Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 677,782, Apr. 16, 1976, abandoned, which is a division of Ser. No. 570,345, Apr. 22, 1975, abandoned. This application Aug. 31, 1977, Ser. No. 829,529

Int. Cl.[2] B05B *5/02*

U.S. Cl. 118—627 **20 Claims**



1. Apparatus for electrostatically and uniformly dispersing particles of lubricating material upon a moving length of electrically conducting substrate, said apparatus comprising:

a housing having transverse dimensions sufficient to encompass the transverse dimensions of said substrate, having a longitudinal dimension sufficient to encompass at least a predetermined portion of said moving length of substrate and having a predetermined depth over at least one side of an intended travel path of the substrate;

said housing being substantially closed at its ends except for ingress and egress openings which permit the conducting substrate to be moved therethrough, along the longitudinal axis of said housing;

a plurality of longitudinal partitions disposed within said housing on said at least one side dividing the interior of said one side of the housing into a plurality of longitudinally extending sections;

electrodes disposed within said longitudinal sections of the housing and spaced from said intended travel path of the substrate;

voltage means for impressing a voltage difference between said electrodes and said substrate as it passes through said housing so as to maintain a corona discharge and charged plasma atmosphere within said longitudinal sections while a substrate is passing therethrough; and

particle generating means communicating with each of said longitudinal sections for supplying a predermined quantity of particles of lubricating material to each longitudinal section.

4,170,194

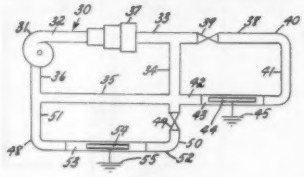
APPARATUS FOR ELECTROSTATIC DEPOSITION

Vladimir N. Etlin, 250 E. 73rd St., New York, N.Y. 10021

Filed Nov. 15, 1976, Ser. No. 741,893

Int. Cl.[2] B05B *5/02;* **B05D** *1/06*

U.S. Cl. 118—629 **7 Claims**



1. Apparatus for applying electrostatically charged powder to an article to be coated comprising:

a continuously open closed circuit conduit loop;

a supply of said powder within said loop;

a high velocity blower in series with said loop whereby to maintain said powder in high speed circulation through said loop and to develop a high electrostatic charge, in the circulating powder, through frictional contact;

said loop including an enlarged conduit section whereby to increase the turbulence of said circulating powder;

at least one branch conduit selectively communicating with said loop;

valve means within said branch conduit to establish said communication;

said branch conduit in said communication forming with part of said closed loop an additional closed loop;

said branch conduit being adapted to contain at least one said article to be coated;

whereby upon establishing said communication at least a portion of said high speed circulating powder is drawn through said additional closed loop to coat said article.

4,170,195

DEVELOPING APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

Klaus-Peter Schön, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 22, 1977, Ser. No. 863,448

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658792

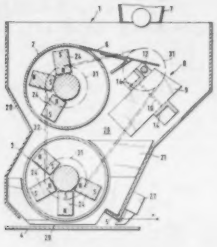
Int. Cl.[2] G03G *13/09*

U.S. Cl. 118—658 **8 Claims**

1. In a developing apparatus for developing latent electrostatic images, comprising a hopper for a developer, two magnetic brush means rotatably supported between the side walls

of the hopper, and strippers for removing the developer from the magnetic brush means,

the improvement comprising a plurality of hinged compartment means in a collecting space for the developer in the hopper, said plurality of compartment means including a



carrier frame with two longitudinal girders interconnected by continuous transverse shafts on which the compartment means are mounted,

and means for oscillating said compartment means in the longitudinal direction.

4,170,196

FISH REARING ENCLOSURE WITH A READILY CLOSABLE MOUTH

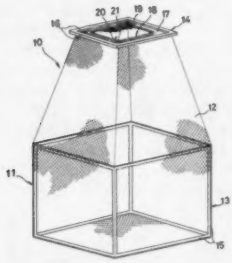
Kiyoo Yoneya, Kurobe, Japan, assignor to Yoshida Kogyo, K. K., Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 761,085

Claims priority, application Japan, Jan. 24, 1976, 51-6629[U]

Int. Cl.[2] A01K *63/00*

U.S. Cl. 119—3 **5 Claims**



1. A fish rearing enclosure comprising, in combination, a sinking framework having spaced frame elements, a separate and discrete floating top frame providing an open top portion of predetermined size and smaller in horizontal section than said sinking framework, flexible net means for covering said framework and for extending to and connecting said floating top frame and for covering said open top portion thereof and coacting therewith to provide an expanded enclosed space maintained by said framework and said net means for accommodating fish to be reared, slide fastener means attached to the portion of said net means covering said open top portion of said floating top frame so as to provide a mouth substantially equal in size to said portion of said floating top frame by opening said slide means, whereby said floating top frame may be manipulated quickly and independently within the range of flexibility of said net means.

4,170,197

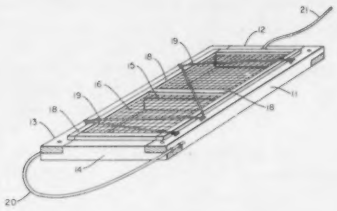
METHOD OF RAISING OYSTERS

Ian M. Walker, Madbury, N.H., assignor to Spinney Creek Oyster Company, Eliot, Me.

Filed Oct. 20, 1977, Ser. No. 843,889

Int. Cl.[2] A01K *61/00*

U.S. Cl. 119—4 **5 Claims**



1. A method of growing marine shellfish comprising

(a) providing a surface-floating, partly submerged tray defined by a rectangular framework of floatable material having a predetermined thickness and enclosed on top and bottom sides with a mesh having a size sufficient to retain a species of shellfish with said framework to be grown therein;

(b) inserting a multiplicity of infants of said species into said tray;

(c) floating said tray on a body of water providing nutrients for said species and being subject to wave action;

(d) maintaining said tray in said water continuously for a period of time sufficient to achieve at least a 1000-fold weight gain in said species;.

(e) periodically turning over said tray during said sustained period; and

(f) recovering as product after said sustained period of time said species so grown.

4,170,198

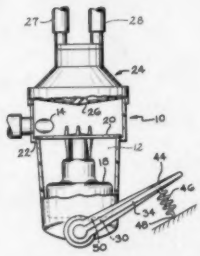
SEMI-AUTOMATIC MILK FLOW SENSOR

Philip D. Gordon, 4690 Willow Rd., Saline, Mich. 48176

Filed Sep. 21, 1977, Ser. No. 835,348

Int. Cl.[2] A01J *5/04*

U.S. Cl. 119—14.08 **8 Claims**



1. In a liquid flow sensor comprising a chamber having an inlet and an outlet positioned below said inlet, a float member disposed in said chamber and having valve means mounted thereon, said float member and said valve means being coincidentally movable in said chamber to open and close communication between said inlet and said outlet, and float elevating means engageable with said float member and movable between a first position in which the movement of said float member and said valve means is unaffected by said float elevating means and a second position in which said float member and said valve means are elevated a predetermined distance providing for open communication between said inlet and outlet, the improvement comprising biasing means urging said

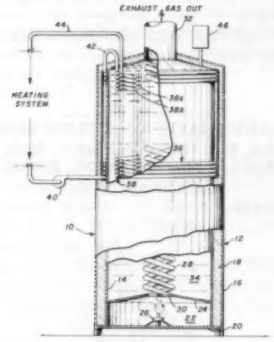
float elevating means toward said first position, and coacting latch means on said float member and on said float elevating means for maintaining said float elevating means in said second position against the urging of said biasing means, said latch means including a shoulder member mounted on said float member, and said float elevating means including an arm member engageable with said float member for elevating said float member and engageable with said shoulder member in the second position of said float elevating means so as to be restrained from return movement to said first position, said arm member being released from engagement with said shoulder member and said biasing means providing for the movement of said float elevating means to said first position when a predetermined amount of liquid is contained in said chamber to support said float member and said valve means at a position maintaining said open communication between said inlet and outlet.

4,170,199

CLOSED HEAT TRANSFER SYSTEM

Robert N. Minor, Stafford Springs, and Roger M. Metivier, Manchester, both of Conn., assignors to Regor Energy Saver Inc., Manchester, Conn.

Filed May 22, 1978, Ser. No. 908,156
Int. Cl.[2] F22B *1/02, 33/02*
U.S. Cl. 122—33 **12 Claims**



1. A source of thermal energy for a closed heat transfer system which is operative as a heating system for a building structure comprising:

(a) heat storage means for storing heat therein;

(b) a heat source mounted in juxtaposed relation to said heat storage means and operative as a source of heat for said heat storage means;

(c) heat transfer means supported within said heat storage means and operative to effect the transfer of waste heat from said heat source to said heat storage means;

(d) preheater means supported in juxtaposed relation to said heat storage means for receiving heat from said heat storage means;

(e) fluid feed means supported in said heat storage means for receiving heat from said heat storage means, said fluid feed means being connected in fluid flow relation with said preheated means; and

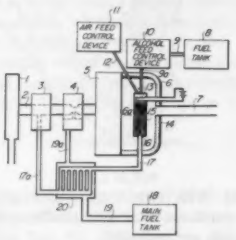
(f) circulator means operative to effect the circulation of fluid through said preheater means and said fluid feed means with the fluid being heated as the fluid circulates through said preheater means and said fluid feed means.

4,170,200

INTERNAL COMBUSTION ENGINE WITH REFORMED GAS GENERATOR

Yukihisa Takeuchi, Aichi, and Kouji Horie, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Cichi, Japan

Division of Ser. No. 583,763, Jun. 4, 1975, abandoned. This application Oct. 13, 1977, Ser. No. 841,909
Claims priority, application Japan, Jun. 14, 1974, 49/68580; Jul. 31, 1974, 49/88268; Sep. 1, 1974, 49/100192
Int. Cl.[2] F02B *43/08;* **F02M** *13/06*
U.S. Cl. 123—3 **10 Claims**



1. A process for reforming a gas in an internal combustion engine comprising:

a combustion chamber;

an intake pipe communicating with said combustion chamber;

an exhaust gas chamber for receiving exhaust gases from said combustion chamber and leading the same to the atmosphere;

a fuel reforming apparatus communicating with said intake pipe for supplying a reformed gas thereto; and,

a reactor means having a catalyst therein for converting a mixture of an alcohol and air into a reformed gas containing hydrogen, said process employing both an alcohol fuel and a hydrocarbon fuel and being carried out without mixing the exhaust gas with the fuel, said process comprising:

feeding an alcohol to said reactor means;

feeding air to said reactor means at a rate of 10 to 15% by weight of the air required for stoichiometric combustion of the alcohol fed to said reactor means, thereby to assure partial oxidation of the alcohol in said reactor means and form said reformed gas containing hydrogen;

feeding a hydrocarbon fuel to said intake pipe;

feeding said reformed gas to said intake pipe;

feeding air to said intake pipe; and

feeding said mixture of hydrocarbon fuel, reformed gas and air to said combustion chamber.

4,170,201

DUAL MODE HYBRID CONTROL FOR ELECTRONIC FUEL INJECTION SYSTEM

John Camp, Birmingham; Alvin D. Toelle, Fenton, and Gene Y. Wen, Troy, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

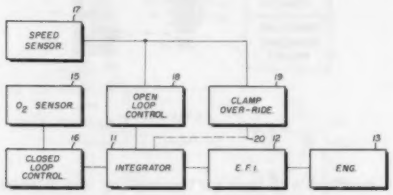
Filed May 31, 1977, Ser. No. 802,201
Int. Cl.[2] F02B *3/00, 75/10*
U.S. Cl. 123—32 EE **29 Claims**

1. A dual mode hybrid control system for controlling the operation of an electronic fuel management system which regulates the air/fuel ratio of an internal combustion engine, the engine operable at different rotational speeds and having a catalytic converter for reducing exhaust gas emissions, said hybrid control system comprising:

means for generating an electrical signal for controlling the operation of said electronic fuel management system;

closed loop comparator means coupled to said signal-generating means for establishing a closed loop control mode for enabling said signal-generating means to nor-

mally operate said electronic fuel management system at air-fuel ratios within a conversion window of maximum efficiency for the converter while said engine operates within a predetermined range of driving speeds to achieve optimal reduction of engine emissions, said range of speeds including those engine conditions at which the level of NOx formation is detrimental and should be converted by said converter; and



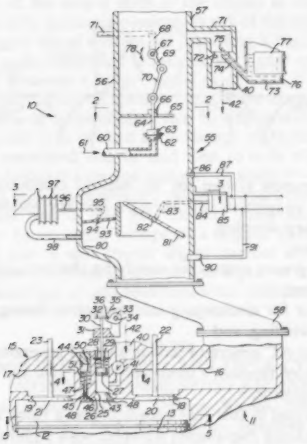
open loop comparator means coupled to said signal-generating means and responsive to the attainment of a driving speed outside of said predetermined range for switching to an open loop control mode for clamping the output of said signal-generating means to a predetermined air/fuel ratio value to operate said electronic fuel management system at a relatively lean air/fuel ratio not within said conversion window for improved fuel economy.

4,170,202

INTERNAL COMBUSTION ENGINE

Charles M. Perkins, R.F.D. 2, Albion, Ill. 62806

Filed May 25, 1977, Ser. No. 800,568
Int. Cl.[2] F02B *19/02, 19/14*
U.S. Cl. 123—75 B **1 Claim**



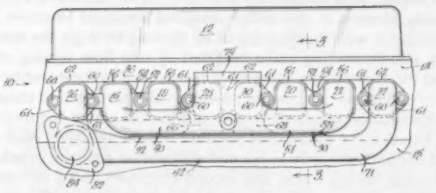
1. In combination with an internal combustion engine including a relatively large main cylinder, a main piston associated with said main cylinder, and inlet and exhaust means for respectively passing a main fuel mixture into and combustion products out of said main cylinder, the improvement comprising a relatively small auxiliary cylinder opening directly into said main cylinder without an intervening passageway between said cylinders, an ignition valve between said main and auxiliary cylinders for opening and closing communication therebetween, auxiliary fuel mixture feeding means communicating with said auxiliary cylinder for feeding the latter, an auxiliary piston associated with said auxiliary cylinder for compressing the fuel mixture in said auxiliary cylinder to ignition when said main cylinder contains a compressed charge of fuel mixture, resilient means urging said auxiliary piston to compress a contained charge to ignition, timing means connected to said main piston, and cam means operatively connected between said timing means and auxiliary piston to retract the same for drawing auxiliary fuel mixture into said auxiliary cylinder and to release the auxiliary piston to compress the auxiliary fuel mixture to combustion, whereby opening of said valve means during ignition in said auxiliary cylinder communicates combustion to said main cylinder for ignition therein of a lean fuel mixture, said auxiliary fuel mixture feeding means including a check valve for passing fuel mixture under vacuum only into said auxiliary cylinder.

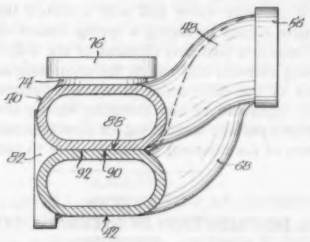
4,170,203

INTAKE AND EXHAUST MANIFOLDS

Sam R. Congram, Peoria, and John M. Corkill, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 8, 1977, Ser. No. 822,845
Int. Cl.[2] F02B *31/00*
U.S. Cl. 123—122 AB **6 Claims**





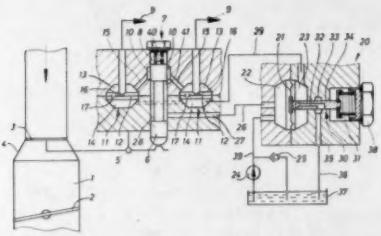
1. In an internal combustion engine including a block and head assembly, a plurality of intake ports and exhaust ports disposed in one side of said assembly, an intake manifold communicating with each said intake port, and a separate exhaust manifold communicating with each said exhaust port, the improvement wherein:

each said intake manifold and exhaust manifold has a substantially linear portion extending longitudinally of said assembly and having a generally elliptical cross section and including an elongated planar outer surface on said generally linear portion, said planar outer surface being in contact over substantially their entire area to facilitate conductive heat transfer between said exhaust manifold and said intake manifold.

4,170,204
FUEL INJECTION SYSTEM

Armin Bauder, Neckarsulm, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,458
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644051
Int. Cl.[2] F02D *3/02*
U.S. Cl. 123—139 AW **6 Claims**



1. In a fuel injection system for a mixture-compressing spark ignition internal combustion engine including an intake manifold having continuous fuel injection into the engine intake manifold, comprising a source of pressurized fuel, a fuel injection nozzle, an adjustable throttle valve in the manifold, a flow sensing element in the intake manifold arranged to move in accordance with the quantity of air flowing through the manifold, a fuel-metering valve operated by said flow sensing element for dispensing a quantity of fuel related to the quantity of air to said nozzle, a constant pressure valve arranged to ensure a substantially constant pressure differential across the metering valve, and a differential pressure regulating valve, each of said constant pressure valve and differential pressure regulating valve having a first and second chambers and a movable partition element separating said chambers from each other, first and second means for communicating the first chamber of the constant pressure valve via said metering valve with said source and with said nozzle respectively, third and fourth means for communicating the first chamber of the differential pressure regulating valve with the second chamber of the constant pressure valve and with a return line respectively, said fourth means including a spring-loaded valve controlled by the movable partition element of the differential pressure regulating element and means for communicating the second chamber of the differential pressure regulating valve to the pressure upstream of the metering valve, the improvement being that a passage is included for directly connecting the two chambers of the constant pressure valve to each other.

4,170,205
FUEL DISTRIBUTION IN INTERNAL COMBUSTION ENGINES

Willy A. Fiedler, 12758 Leander Dr., Los Altos Hills, Calif. 94022

Filed Oct. 5, 1977, Ser. No. 839,633
Int. Cl.[2] F02M *41/00*
U.S. Cl. 123—139 AS **3 Claims**

1. In an internal combustion engine having fuel pressure regulation means, fuel metering means, a plurality of cylinders, each of said cylinders having a fuel valve with a plunger aspirating and expulsing increments of fuel and complementary vent air, an arrangement for fuel distribution comprising in combination:

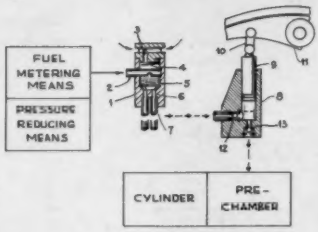
a receptacle for receiving fuel from said fuel metering means and vent air, for equal apportioning and sequential release of said increments of said fuel and said vent air in response to successive aspirations by said fuel valves, including

an inlet for admitting said fuel,

a vent for admitting said vent air,

means for preventing fuel sloshing,

a plurality of outlets evenly spaced in circular arrangement in the bottom of said receptacle;

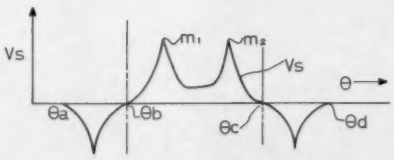


a manifold with lines for transmitting said increments from said outlets to said fuel valves, said lines connected to ensure circular succession of the releases of said increments from said receptacle.

4,170,206
IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Mitsuo Katsumata, and Hirotoshi Nanjyo, both of Susono, Japan, assignors to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Mar. 23, 1977, Ser. No. 782,385
Claims priority, application Japan, Aug. 27, 1976, 51-113934[U]
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—148 CC **2 Claims**



1. An ignition system for an internal combustion engine comprising an ignition coil having a primary winding and

a secondary winding,

a capacitor,

a charge power source for supplying charge current of said capacitor,

a thyristor for discharging said capacitor through said primary winding, and

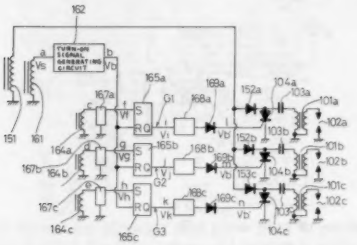
a magneto AC generator having a signal generating winding connected through a diode across the gate and cathode of said thyristor,

characterized in that said generator has a rotor including a substantially cup-shaped flywheel with a plurality of permanent magnets arranged about the inner periphery of said flywheel so as to produce a substantially alternating magnetic field about the circumference except at a part thereof where the magnetic field is unchanged, and a substantially U-shaped stator core on which said signal generating winding is wrapped, said U-shaped stator core having a pole to pole distance corresponding to the circumferential length of said part where the magnetic field in unchanged, whereby at least two successive local maximum points to appear in the rate of change of the magnetic flux interlinked with said signal generating winding, so that the waveform of the voltage induced in said signal generating winding has at least two successive peaks of the same polarity.

4,170,207
IGNITION SYSTEM FOR A MULTICYLINDER INTERNAL COMBUSTION ENGINE

Kimihiro Boyama, Numazu, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Jun. 16, 1977, Ser. No. 807,114
Claims priority, application Japan, Jun. 21, 1976, 51/73037
Int. Cl.[2] F02P *5/00, 1/00*
U.S. Cl. 123—148 CC **5 Claims**



1. An ignition system for a multicylinder internal combustion engine comprising first to n-th (n being an integer greater than unity) ignition coils respectively provided in conjunction with first to n-th cylinders of the engine, first to n-th capacitors respectively provided on the primary sides of said first to n-th ignition coils, at least one power source for charging said first to n-th capacitors, first to n-th semiconductor switches with a control terminal respectively provided on the primary sides of said first to n-th ignition coils and respectively adapted to be turned on for discharging said first to n-th capacitors through the first to n-th primary windings of said first to n-th ignition coils, a turn-on signal source for producing a turn-on signal for turning on said semiconductor switches at least n times per revolution of the output shaft of the engine at the rotational angles at which ignition is expected in any of the cylinders, first to n-th trigger signal sources for providing a trigger signal in sequence, each of said first to n-th trigger signal sources being adapted to generate a trigger signal at an angle in advance of the maximally advanced ignition angle of the associated one of said first to n-th cylinders, and first to n-th gate circuits, each being adapted to be opened upon receipt of the trigger signal from the associated one of said first to n-th trigger signal sources to enable the turn-on signal to be applied to the associated one of said semiconductor switches, characterized in that each of said first to n-th gate circuits comprises a flip-flop adapted to be set upon receipt of a trigger signal from the associated one of said trigger signal sources to produce an output signal for enabling the turn-on signal to be applied to the associated one of said semiconductor switches.

4,170,208
IGNITION SYSTEM FOR A MULTIPLE CYLINDER INTERNAL COMBUSTION ENGINE

Mitsuo Katsumata, Susono; Tetsuya Kondo, Shizuoka, and Takeshi Watanabe, Fuji, all of Japan, assignors to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Mar. 6, 1978, Ser. No. 883,877
Claims priority, application Japan, Mar. 7, 1977, 52/24558
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 CC **9 Claims**

1. An ignition system for a multiple cylinder internal combustion engine, comprising:

a power supply,

a plurality of ignition coils,

a plurality of control circuits, each provided in association with a respective one of said ignition coils for controlling the primary current of the associated ignition coil, and

a plurality of signal sources producing signals in turn and in synchronism with the rotation of the engine, each of said signal sources provided in association with a respective one of said control circuits, and adapted to produce a signal in advance of the ignition timing of the associated ignition coil,

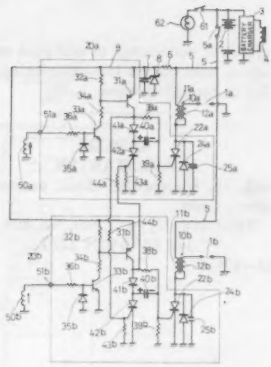
wherein each of said control circuits includes:

a gate turn-off thyristor connected to form a series circuit with the primary winding of the associated ignition coil, said series circuit being connected to said power supply,

a transistor switch provided to conduct in response to the signal from the associated signal source,

a first coupling means for coupling the gate of said gate turn-off thyristor to said power supply through said transistor switch to turn on said GTO when said transistor is conducting,

a capacitor,



a second coupling means for coupling said capacitor to said power supply through said transistor switch to charge said capacitor when said transistor switch is conducting,

an auxiliary thyristor for discharging said capacitor to apply a turn-off signal to said gate turn-off thyristor,

a third coupling means for coupling the gate of said auxiliary thyristor to said power supply through the transistor switch of a control circuit in association with one of other signal source producing a signal at the ignition timing of the ignition coil associated with said auxiliary thyristor to be coupled by said third coupling means,

whereby said gate turn-off thyristor is turned on in response to the signal from the associated signal source to permit a current flow through the primary winding, and is turned off in response to the signal from said one of other signal source at the ignition timing of the associated ignition coil.

4,170,209
IGNITION DWELL CIRCUIT FOR AN INTERNAL COMBUSTION ENGINE

Adelore F. Petrie, Arlington Heights, and Rupin J. Javeri, Elk Grove Village, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 12, 1978, Ser. No. 905,260
Int. Cl.[2] F02P *5/00*
U.S. Cl. 123—148 E **8 Claims**

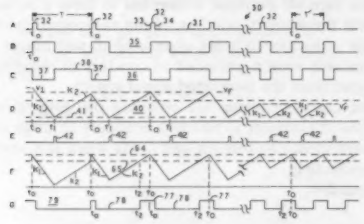
8. A dwell circuit for an ignition system including:

means for producing a periodic input signal varying at a predetermined rate and having a variable peak magnitude which occurs at predetermined rotational positions of the crankshaft of an engine;

clamping means for receiving said input signal and producing a similarly varying clamped signal in which the corresponding peak magnitude of the clamped signal is clamped to a first reference level; and

comparator means for receiving said clamped signal and comparing it with a second reference level offset from said

first reference level so as to produce an output transition at an output of said comparator means during the varying of said input signal at said predetermined rate at a fixed



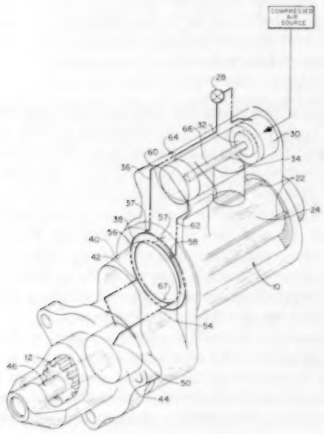
time before the occurrence of said peak magnitude of said input signal, said output transition being used to initiate dwell for an ignition system.

4,170,210

AIR STARTER

Leon P. Janik, Jr., Hazardville, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Jun. 22, 1977, Ser. No. 809,103
Int. Cl.[2] F02N *17/00*
U.S. Cl. 123—179 F **5 Claims**



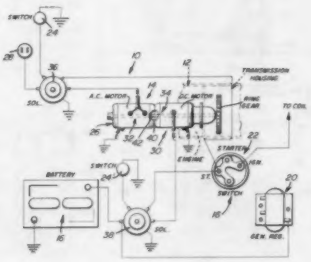
1. An air starter including an air motor having a first housing with an air inlet suited for receiving air from a source of high pressure to power the air motor and an axially movable drive pinion having a second housing and being selectively engageable with an engine flywheel to rotate the same, said air motor and said drive pinion being respectively mounted on axially displaced radially offset gear connected shafts, an air operated piston for advancing said drive pinion to engage said flywheel, and air passage means providing communication between said air inlet and said piston, said air passage means including a pair of spaced grooves on the end wall of a mounting flange of one of said housings and a pair of ports on the mating end wall of a mounting flange of the other of said housings, aid grooves being concentric with the shaft mounted by the other of said housings and said ports being disposed at the same radial distances respectively as said grooves from said shaft of the other of said housing and the same radius from said shaft of said one housing to provide communication with said grooves regardless of the relative angular disposition of said housings with respect to each other.

4,170,211

COMBINATION AC AND DC ELECTRICAL STARTING MOTOR FOR ENGINES

Robert W. Worthington, 713 Franklin St., Manitowoc, Wis. 54220

Filed Sep. 2, 1977, Ser. No. 830,338
Int. Cl.[2] F02N *17/00, 11/00*
U.S. Cl. 123—179 B **3 Claims**



1. In an internal combustion engine prime mover system including an internal combustion engine, starter motor means coupled to the engine for starting the engine, a battery connected to the starter motor means, and an ignition system connected to the battery and to the starter motor means for controlling the starter motor means, the improvement wherein the starter motor means comprises, in combination:

(a) first means responsive to a first current for actuating the starter motor means;

(b) second means responsive to a second current different from the first current for actuating the starter motor means simultaneously with the first means; wherein each of the first means and second means comprises, in combination:

(1) an electric motor; and

(2) an electrical solenoid connectible to a source of current for selectively actuating the motor simultaneously with actuating of the motor of the other of the first and second means by the solenoid of the other of the first and second means, the solenoid of the first means being actuatable by a DC current for supplying DC current to its respective motor, and the solenoid of the second means being actuatable by a DC current for supplying AC current to its respective motor, the DC and AC current forming the first current and second current, respectively; and

wherein said ignition system includes an ignition switch which is electrically connected to said electrical solenoid of said first means and said electrical solenoid of said second means for effecting actuation of each solenoid by supplying DC current thereto for simultaneously actuating each solenoid.

4,170,212

IGNITION SYSTEM FOR ROTARY PISTON ENGINES

Kouichi Mori, Okazaki; Toshihiko Igashira, Toyokawa; Shunzo Yamaguchi, Okazaki; Hisasi Kawai, Toyohashi, and Seiji Morino, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 13, 1977, Ser. No. 860,218
Claims priority, application Japan, Dec. 26, 1976, 51-157283
Int. Cl.[2] F02B *53/12*
U.S. Cl. 123—211 **5 Claims**

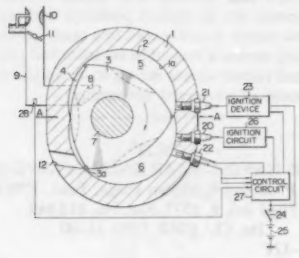
1. An ignition system for a rotary piston engine having a trochoidal housing and a rotor, comprising:

a leading spark plug mounted in said housing on the leading side with respect to the trochoidal minor axis of said housing in the direction of rotation of said rotor;

a trailing spark plug mounted in said housing on the trailing side with respect to said trochoidal minor axis in the direction of rotation of said rotor;

a glow plug mounted in said housing on the leading side with respect to said trochoidal minor axis in the direction of rotation of said rotor;

ignition means for causing said trailing spark plug to perform an ignition operation throughout the range of operating conditions of said engine;



a control circuit for allowing said glow plug to perform a mixture igniting function when said engine is under low speed and low load operation; and

an ignition circuit for causing said leading spark plug to perform an ignition operation when said glow plug is not serving said mixture igniting function.

4,170,213

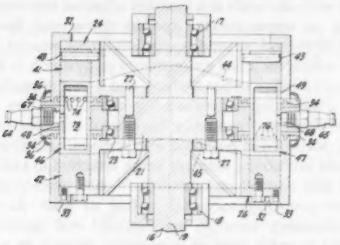
ROTARY ENGINE

Benjamin F. Williams, Douglas, Ariz., assignor to Benwilco, Inc., Douglas, Ariz.

Filed Mar. 7, 1977, Ser. No. 774,854

Int. Cl.[2] F02B *53/00*

U.S. Cl. 123—222 **2 Claims**



1. A rotary engine comprising a stator concentric with an axis and having opposite sides substantially normal to said axis, means defining a cylinder extending through said stator parallel to said axis, a pair of rotor rings, means for mounting said rotor rings in abutment with said opposite stator sides and for rotation about said axis, a pair of complementary and axially undulatory cam rings, means for mounting said cam rings respectively in said rotor rings for rotation therewith and with a substantially constant axial distance between said cam rings thereby defining working chambers between said cam rings and said stator sides, a unitary hollow piston disposed in said cylinder with the axially opposite ends of said piston in abutment with said cam rings, said hollow piston having one-piece walls including a leading wall and an outermost wall and a trailing wall defining a substantially enclosed explosion chamber of fixed volume within said piston, means defining intake and exhaust ports through said leading and trailing walls in position for alternate masking of said ports by said stator and for connection of said explosion chamber through said ports to said working chambers alternately on opposite sides of said stator, means in said stator open to said working chambers for conducting fuel mixture and exhaust to and from said working chambers, and means for igniting said fuel mixture within said explosion chamber including means defining an ignition port in said piston outermost wall and including an ignition chamber provided with an ignition device and open to said explosion chamber through said ignition port in one relative position of said stator and said explosion chamber.

4,170,214

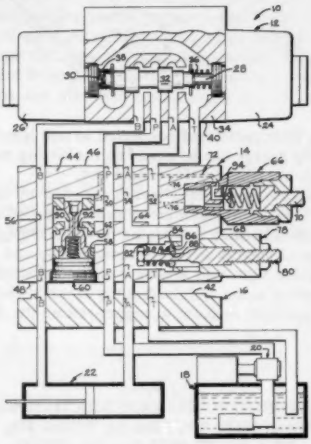
HYDRAULIC VALVE MODULE

Arthur W. Gill, Saline, and Ronald L. Loup, Clarkston, both of Mich., assignors to Double A Products Company, Manchester, Mich.

Filed Jan. 23, 1978, Ser. No. 871,219

Int. Cl.[2] F17D *1/00*

U.S. Cl. 137—269 **11 Claims**



1. A hydraulic valve module adapted to be sandwiched between a directional valve and a subplate, each of which has a mounting surface with uniform hole patterns for pressure, tank, and two cylinder ports, said module comprising a manifold block having opposite surfaces adapted to fit respectively against the mounting surfaces of the directional valve and the subplate, said block having ports providing uniform hole patterns on said opposite surfaces for alignment with the hole patterns of said directional valve and subplate and having main passageways associated respectively with the sets of corresponding ports on opposite surfaces for flow of hydraulic fluid therebetween, said block also having at least one chamber opening to one of said opposite surfaces to provide an entrance of a size sufficient for receiving a flow-function valve cartridge, said chamber being in communication with one of said sets of corresponding ports so that the one main passageway associated with that set passes through the chamber, and a flow-function valve cartridge dimensioned for insertion through said entrance and housed within said chamber, said flow-function valve cartridge having at least one movable element to enable the cartridge to perform a selected function on hydraulic fluid in said one associated passageway, said manifold block also having an auxiliary passageway between said chamber and another of said main passageways for pilot actuation of said flow-function valve cartridge.

4,170,215

DISK TOY AND LAUNCHER

John S. Kettlestrings, 299 Carleton Dr., Carol Stream, Ill. 60187

Filed Jan. 6, 1978, Ser. No. 867,571

Int. Cl.[2] F41B *3/04*

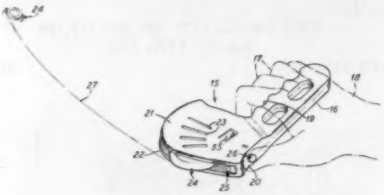
U.S. Cl. 124—16 **13 Claims**

13. A launcher for an aerodynamic disk toy, a disk toy to be

launched having a peripherally recessed circumferential edge comprising,

a body member sized to be held in the hand of a user and having a finger actuated trigger extending outwardly of said body for selective engagement by the user, and including a launch housing forming a slot in which a disk toy is inserted,

pre-loadable biasing means comprising a leaf spring forming recess engaging means at one end disposed in said slot for entering the peripherally recessed edge of the disk toy and



having its opposite end connected to said launch housing whereby energy can be stored on the biasing means when the disk toy is inserted into said slot,

and cocking and releasing means actuated by said trigger comprising a retractable catch member carried on a side of said launch housing and having means to engage and hold an edge of the disk toy when tensioned by said spring and cooperable with said biasing means to temporarily lock said biasing means and the disk toy in pre-loaded assembly and selectively actuable to trigger-release the disk toy for flight.

4,170,216

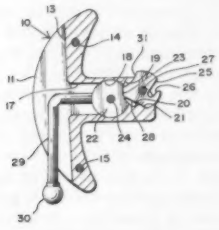
BOWSTRING RELEASE MECHANISM

Hugh R. Wilson, 10840 SW. 120th St., Miami, Fla. 33176

Filed Jan. 10, 1978, Ser. No. 868,413

Int. Cl.[2] F41B *5/00*

U.S. Cl. 124—35 A **4 Claims**



1. A bowstring holding and release mechanism comprising a holding and release means for releaseably engaging a bowstring, said holding and release means comprising a rotating holding and release means for movement between a cocked and an uncocked position for holding and releasing a bowstring, respectively,

a rotating locking means for locking said holding and release means in a cocked position when said locking means is in a cocked position,

means on the periphery of said holding and release means, said last mentioned means bearing against a portion of the periphery of said locking means and preventing the rotation of said holding and release means when said holding and release means and said locking means are in a cocked position, trigger means unitary with said locking means for engagement and actuation by the hand of an archer

means on the periphery of said locking means for releasing said holding and release means to permit rotation thereof when said locking means is moved to an uncocked position in response to said hand actuation, said locking means remaining in contact with said holding and release means with said means on the periphery said locking means acting against the rotation of said holding and release means when the holding and release means is in an uncocked position,

whereby when said holding and release means and said locking means are in cocked positions and said holding and release means is connected to a tense bowstring, and said locking means is moved to an uncocked position, said holding and release means moves to an uncocked position under tension of a released bowstring.

4,170,217

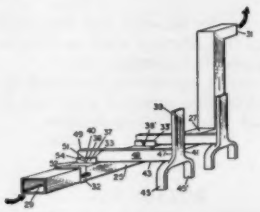
ANDIRONS HAVING REAR END LOCKING MEANS

C. C. Mayes, P.O. Box 8, Pigeon Forge, Tenn. 37863

Filed Jul. 8, 1977, Ser. No. 813,849

Int. Cl.[2] F24B *7/00, 13/00*

U.S. Cl. 126—121 **3 Claims**



1. In a fireplace comprising a floor, a front wall defining an opening, a rear wall disposed opposite said front wall, a pair of oppositely disposed side walls and a chimney, an andiron system comprising means defining ledge means fixedly secured between said side walls at a location adjacent said rear wall and including an upper surface spaced above said floor, means defining first and second spaced-apart elongated channels, each of which includes an open top and which is fixedly secured to said ledge upper surface, and a pair of andirons, each andiron comprising a forward leg member resting upon said floor, an elongated generally horizontal member including a first end portion and a second end portion, said first end portion of said horizontal member being attached to said leg member and said second end portion of said horizontal member being non-pivotally received in one of said channels, and means releasably securing said second end portion of said horizontal member against movement thereof in a direction forwardly of said fireplace or in a vertical direction without prior non-vertical movement thereof whereby said andirons are restrained from moving laterally relative to one another and said fireplace.

4,170,218

FIREPLACE HEATERS

Ronald C. Hartley, 1963 W. Sixth Ave., Eugene, Oreg. 97402

Filed Aug. 15, 1977, Ser. No. 824,534

Int. Cl.[2] F24B *7/00*

U.S. Cl. 126—121 **3 Claims**

1. In a fireplace heater,

a U-shaped rear duct having a forwardly opening inlet and an outlet and formed into a grate to be inserted into a fireplace for supporting wood to be burned,

an inlet duct telescopically fitting into the inlet,

an outlet duct telescopically fitting into the outlet,

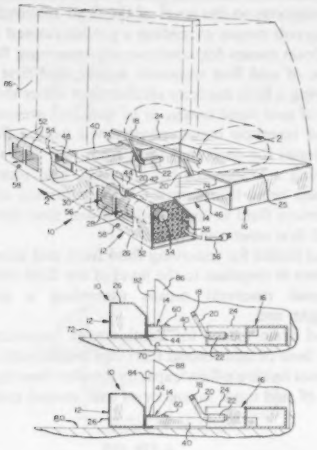
blower means connected to the inlet duct,

and a grill-like housing means connected to the blower means and mechanically connecting the inlet duct to the outlet duct and adapted to lay along a hearth outside a fireplace,

the blower means being mounted in the housing,

the rear duct being invertible,

the inlet and the outlet being positioned in the upper portion of the rear duct when the latter is in one position for a



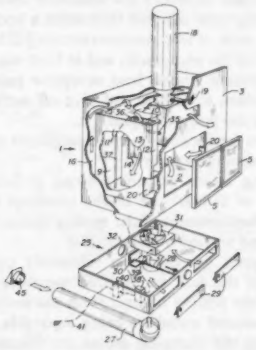
pit-type fireplace and the inlet and the outlet being positioned in the lower portion of the rear duct when the latter is in an inverted position for a flush-type fireplace.

4,170,219

FIREPLACE

William A. Hansen, 95 Ashland Ave., Winnipeg, Manitoba, and William A. Conly, 720 Vaughn Ave., Selkirk, Manitoba, both of Canada

Filed Oct. 12, 1977, Ser. No. 841,352
Claims priority, application Canada, May 6, 1977, 277887
Int. Cl.[2] F24B *1/18*
U.S. Cl. 126—121 **1 Claim**



1. A heater for circulating air and adapted to be disposed within a fireplace provided with a flue said heater comprising an upper portion and a lower portion:-

the upper portion including:

(a) a firebox capable of receiving fuel, having a closable front opening and adapted to be connected to said flue;

(b) an intermediate housing disposed about, and spaced from, said firebox so as to define a plenum chamber intermediate said firebox and said housing;

(c) at least one primary flow chute within said housing adjacent one side thereof;

(d) an outer housing disposed about, and spaced from, said intermediate housing so as to define an outer plenum chamber between said pair of housings; and

(e) at least one dampered vent leading from said outer plenum chamber to said firebox;

the lower portion including:

(f) an air chamber located beneath said upper portion and in communication with the outer plenum chamber as well as with atmospheric air and ambient air;

(g) damper means for regulating the amount of atmospheric air admitted to the air chamber;

(h) at least one adjustable vent for regulating the amount of ambient air admitted to the air chamber; and

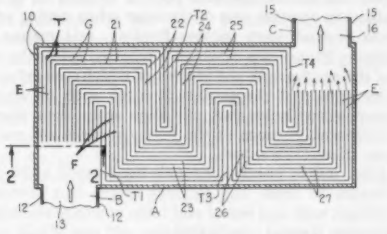
(i) a fan within the air chamber for forcing the air admitted thereto into the outer plenum chamber where a portion of the air is metered through said dampered vent to the firebox for combustion purposes and where the balance of said air is forced from said outer plenum chamber, through the chutes into the intermediate plenum chamber and from the latter over the heated surfaces of the firebox and from said heater to the area to be heated.

4,170,220

SOLAR HEAT COLLECTOR

Henry C. Smith, P.O. Box 307, Johns Island, S.C. 29455

Continuation of Ser. No. 736,820, Oct. 29, 1976, abandoned.
This application Jun. 2, 1978, Ser. No. 912,096
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—428 **1 Claim**



1. For use in a solar heat collector having a box, a plurality of baffles in said box, a fluid inlet port in said box, and fluid outlet port in said box, and transparent panel means at least partially covering said box exposing the interior of said box including said baffles to the sun's rays, the improvement comprising:

a first plurality of said baffles carried in side-by-side upright relation within said box exposed to the sun's rays to form a first plurality of side-by-side generally horizontal passageways each connected to said inlet port for transporting fluid in a first horizontal direction therefrom;

a second plurality of said baffles carried in side-by-side upright relation within said box exposed to the sun's rays to form a second plurality of side-by-side generally horizontal passageways each connected to said outlet port for transporting fluid in a second horizontal direction thereto;

at least a third plurality of baffles carried in side-by-side relation forming third passageways interconnecting said first passageways with said second passageways, said third passageways providing horizontal flow to said first and second passageways;

a bottom included in said box exposed to the sun's rays passing through said transparent panel and between said baffles;

said first, second, and third plurality of baffles terminate within said panel means adjacent said transparent panel at a top edge of said baffles and adjacent said box bottom at a lower edge of said baffles in heat transfer relation therewith for reception of the sun's rays through the panel; and

border baffle means extending in flush relation with said panel means between said first and second plurality of

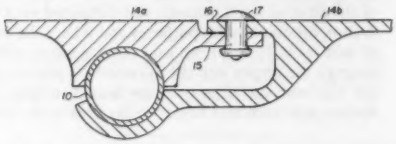
baffles preventing fluid communication between said first and second passageways except by said third passageways.

4,170,221

SOLAR HEAT COLLECTOR CONSTRUCTION

Joseph G. Gavin, Huntington, N.Y., assignor to Grumman Corporation, Bethpage, N.Y.

Division of Ser. No. 750,580, Dec. 15, 1976, Pat. No. 4,086,913.
This application Jan. 16, 1978, Ser. No. 869,719
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—446 **1 Claim**



1. A solar collector comprising:

an array of a plurality of spaced tubes for conducting heat exchange fluid;

means to collect energy and transfer same to said tubes, said means comprising finplanks each of which has a portion inwardly and exteriorly respectively of their mating edges contoured with one portion adapted to be placed about one side and an opposite portion adapted to be placed about an opposite side of the tubes when mating edges of one finplank with another finplank, said mating edges having flanges one of which is recessed below the surface of the one finplank and another of which is an extension of the surface of the another finplank each of which has prepunched holes that will align when their respective contoured portions of the finplank edges are encircling one of said tubes: and

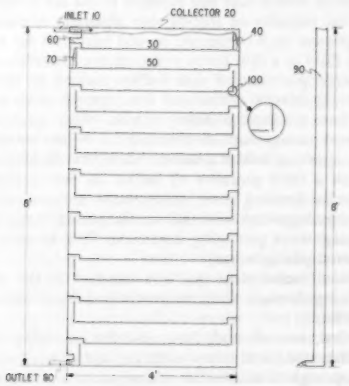
fastener means inserted through the aligned holes of said flanges to draw said finplank edges into compressive contact with said one of said tubes whereby said finplanks provide thermal conductivity to said one of said tubes.

4,170,222

SOLAR HEAT COLLECTOR

Roy D. Barker, 5228 Lone Tree Dr., Loveland, Colo. 80537

Filed Aug. 19, 1977, Ser. No. 825,932
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—420 **6 Claims**



1. A solar heat collector comprising:

input means for receiving a fluid;

first reservoir means constructed from a flexible plastic material coupled to said input means for retaining a volume of the fluid therein, said first reservoir means being transparent to solar radiation;

first means for removing fluid from said first reservoir means in response to the level of the fluid retained by said first reservoir means exceeding a predetermined height;

first drain means for continuously removing fluid from the base of said first reservoir means, said first drain means having a flow capacity smaller than either the flow capacity of said input means or of said first means;

second reservoir means constructed from a flexible plastic material for receiving fluid from said first means for retaining a volume of fluid therein, said second reservoir means being transparent to solar radiation and positioned to retain fluid at an elevation lower than that retained by said first reservoir means;

second means for removing fluid from said second reservoir means in response to the level of the fluid retained by said second reservoir means exceeding a predetermined height; and

second drain means for continuously removing fluid from the base of said second reservoir means, said second drain means having a flow capacity smaller than the flow capacity of said input means or of said second means.

4,170,223

SOLAR HEAT ENERGY COLLECTOR

Andries C. Weideman, 14 Leipoldt St., Parow North, South Africa

Filed Jun. 21, 1977, Ser. No. 808,677
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—450 **16 Claims**

1. A solar heat collector including:

first and second members for assembly into an enclosed hollow receptacle adapted to contain a body of liquid to be heated, each of said members forming at least part of an inner wall of the receptacle, and at least one of said members comprising a solar heat receptive panel adapted to receive radiant solar heat and give off such heat by conduction to the body of liquid;

sealing means for location between adjacent portions of the first and second members;

outer locating means extending along at least part of the periphery of at least one of the members for restricting outward displacement of the sealing means from between the first and second members; and

clamping means for engaging releasably over peripheral portions of the first and second members to urge such portions into sealing contact with the sealing means the first and second members being separable from one another when the clamping means are released, thereby to permit exposure of at least part of the inner wall of the receptacle.

4,170,224

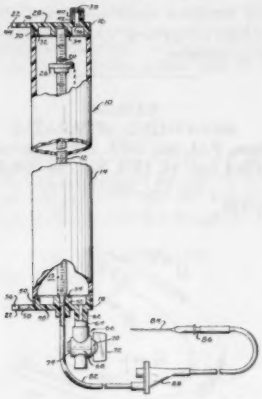
BODY FLUID MEASURING DEVICE

Scott T. Garrett, Highland Park; William L. Rudzena, Fox Lake, and Thurman S. Jess, Mundelein, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 25, 1977, Ser. No. 844,680
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—748 **4 Claims**

1. In a body fluid measuring device comprising a chamber, an elongated indicator tube carried at least in part within said

chamber, conduit means in flow communication with one end of said tube for conveying body fluid thereto, the distance of travel of fluid along said tube representing the pressure of the body fluid and at least one opening means in said indicator tube through which body fluid may flow into said chamber, the



improvement comprising overflow control means including an annular platform carried by said indicator tube below said opening means to conduct overflowing fluid outwardly from said indicator tube and permit it to drop from the peripheral edge of said platform into said chamber generally free of contact with the indicator tube.

4,170,225

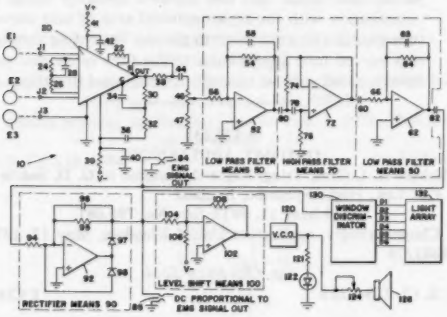
BIOFEEDBACK DEVICE

John J. Criglar, Oakland, and Lawrence T. Petraki, San Francisco, both of Calif., assignors to Somatronics, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 724,949, Sep. 20, 1976, abandoned. This application Mar. 16, 1977, Ser. No. 777,883

Int. Cl.[2] A61B *5/05*

U.S. Cl. 128—733 **10 Claims**



1. A biofeedback device for monitoring the electric signal produced by muscle activity or the like including means for detecting and amplifying said electric signal, filter means for suppressing unwanted components of said detected signal, sensitivity control mean. for enabling the level of said detected signal to be selectively set, and means for providing visual feedback of the signal output by said filter means, said visual feedback means comprising:

rectifier means for generating a D.C. voltage signal proportional to said signal output by said filter means; and

visual indicia means for providing a visual output representative of said D.C. voltage signal, and including a light array in the form of a plurality of serially positioned lights.

4,170,226

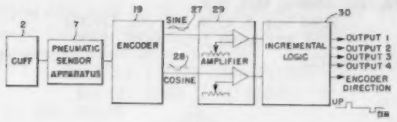
DIGITAL SPHYGMOMANOMETER

Bolivar Albainy, 8408 Sierra Oval, Parma, Ohio 44130, and Alexis E. Khoury, 11 Spring St., Danielson, Conn. 06239

Filed Jul. 27, 1977, Ser. No. 819,488

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—667 **4 Claims**



1. A digital sphygmomanometer comprising an inflatable cuff adapted to be wrapped around a patient's arm and having pump means and bleed valve means respectively operative to inflate said cuff to a pressure exceeding the expected systolic pressure of the patient and to bleed said cuff to gradually decrease the pressure therein; cuff pressure sensing means including a member exposed to the decreasing cuff pressure and movable linearly in one direction in proportion to the decreasing magnitude of the cuff pressure; digital systolic and diastolic pressure readout means; and transducer means for detecting reversal of movement of said member when cuff pressure decreases to just below patient's systolic pressure; latch means responsive to detection of such reversal by said transducer means for setting the patient's systolic pressure on said systolic pressure readout means; said transducer means including means for detecting cessation of pressure reversals when cuff pressure decreases to the patient's diastolic pressure; and further comprising means responsive to detection of such cessation by said transducer means for setting the patient's diastolic pressure on said diastolic pressure readout means.

4,170,227

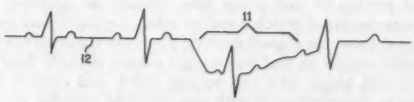
APPARATUS AND METHOD FOR ECG BASELINE SHIFT DETECTING

Charles L. Feldman, and Mark Hubelbank, both of Sudbury, Mass., assignors to Electronics for Medicine, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 754,538, Dec. 27, 1976, Pat. No. 4,112,930. This application Jun. 22, 1978, Ser. No. 917,877

Int. Cl.[2] A61N *5/04*

U.S. Cl. 128—704 **6 Claims**



1. Apparatus for providing an ECG signal and detecting baseline shift in said ECG signal comprising,

a first multielement electrode means having elements closely spaced but insulatedly separated for connection to a first surface portion of a patient, the ECG.potential between said elements being negligible,

a second multielement electrode means having elements closely spaced but insulatedly separated for connection to a second surface portion of said patient, the ECG potential between said elements being negligible,

first means for differentially combining the potentials of one element of said first multielement electrode means and one element of said second multielement electrode means for providing a first ECG signal,

second means for differentially combining the potentials of

another element of said first multielement electrode means and another element of said second multielement electrode means for providing a second ECG signal,

and means for differentially combining said first and second ECG signals to provide an artifact signal representative of baseline shift in said ECG signals.

4,170,228

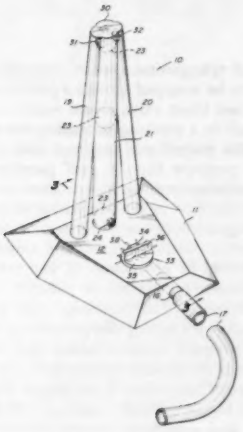
VARIABLE FLOW INCENTIVE SPIROMETER

Edward E. Elson, Anaheim; Ernest L. Burke, Los Angeles, and G. William Rogers, La Canada, all of Calif., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Nov. 5, 1976, Ser. No. 739,271

Int. Cl.[2] A61B *5/08*; A63B *23/00*

U.S. Cl. 128—725 **5 Claims**



1. A variable flow incentive spirometer comprising a housing, a manifold chamber within said housing, a breathing tube extending from said housing and being in communication with said manifold chamber, an elongated closed bottom vertical cylindrical gauge tube mounted on the top of said housing, a movable weight having a circular cross-section within said gauge tube and movable within the entire length of said gauge tube, atmospheric vent means in said gauge tube below the lowest position of the center of said movable weight, a pair of suction tubes upstanding from said housing on either side of said gauge tube and connected in fluidic communication with said manifold chamber, the upper portion of said pair of suction tubes each connected in fluidic communication with the upper portion of said gauge tube through an aperture, the entire perimeter of which is spaced below the top of said gauge tube and above the highest position therein of the center of said movable weight so that said weight cannot occlude flow between said gauge tube and suction tubes, and control vent means in communication with said manifold chamber to vary the amount of inhalation flow necessary to raise said weight means whereby inhalation effort necessary to raise said movable weight to the top of said gauge tube indicates achieving the preset inhalation flow set on said control vent means.

4,170,229

METHOD FOR IMPROVED HEALTH CARE OF HAIR AND SCALP USING A VITAMIN A AQUEOUS EMULSION

B. Newell Olson, Norwich, N.Y., assignor to Dominion Pharmacal, Inc., Norwich, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,774

Int. Cl.[2] A61H *7/00*; A61K *31/07, 31/195*

U.S. Cl. 128—67 **3 Claims**

1. A method for treating conditions of hair and scalp to effect conditioning thereof and relief from dandruff symptoms, said method comprising spraying a fine mist of an aqueous emulsion in sufficient amount to effect moistening thereof and brushing said hair and scalp with a hand held brush having bristles, said brushing being carried out in sufficient number of strokes to effect even distribution thereof throughout said hair and scalp, said emulsion containing an effective amount of essential ingredient comprising Vitamin A palmitate and allantoin N-acetyl methionine.

4,170,230

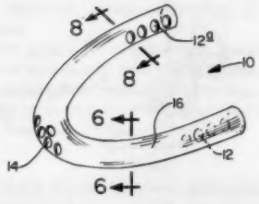
BREATHING APPARATUS

Byron G. Nelson, P.O. Box 6457, Lake Charles, La. 70606

Filed Apr. 14, 1978, Ser. No. 896,303

Int. Cl.[2] A61M *15/00*

U.S. Cl. 128—139 **9 Claims**



1. A breathing apparatus fitable into the mouth of a human between cheeks and teeth which apparatus includes:

a. flexible curved tube means being open-ended and having sufficient length to extend along a path following the tooth line from a point adjacent one set of molars to a point adjacent the other set of molars;

b. at least one intake opening located midway said curved tube means so that said intake opening will be positioned towards the outside of the mouth and proximate to the middle of said mouth; and,

(c) at least one exhaust opening in each side of said curved tube means adapted to face the inside of said mouth, proximate the open ends of said curved tube and located at a point above the lower-most point of said curved tube means, said intake and said exhaust openings being, in combination with the cross-sectional area of said curved tube means, a size sufficient to allow a flow of air through said curved tube approximate to the flow of air that said human could achieve through normal nasal breathing.

4,170,231

OSTOMY APPLIANCES

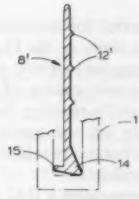
Michael H. Collins, Tring, England, assignor to G. D. Searle & Co., Ltd., High Wycombe, England

Filed May 11, 1977, Ser. No. 795,681

Claims priority, application United Kingdom, May 12, 1976, 19481/76

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—283 **1 Claim**



1. An ostomy set having a retaining ring which can be se-

cured to the body of a patient, said ring having a peripheral retaining recess formed by a front wall, a bottom wall and a back wall, said front wall and said back wall having inner, opposed planar surfaces, and a bag or irrigation sleeve which has a fixing ring of a size complementary to that of the retaining ring, said fixing ring having an internal surface with a bead extending from one face thereof and a lip extending from the opposite face thereof, said bead and said lip simultaneously engaging said opposed inner surfaces of said front and back walls of said retaining ring, and said bead having a generally triangular cross section which is greater than the cross section of said lip.

4,170,232

TRACHEO-BRONCHIAL SAMPLER DEVICE

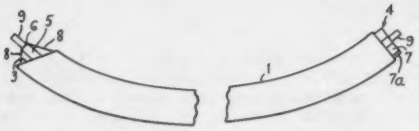
Francis E. Khoury, 63 St. Leonards Rd., Hove, Sussex, England

Filed Aug. 15, 1977, Ser. No. 824,625

Claims priority, application United Kingdom, Aug. 26, 1976, 35642/76

Int. Cl.[2] A61M *25/00*

U.S. Cl. 128—351 **4 Claims**



1. A tracheo-bronchial sampler device comprising:
an outer chest tube capable of insertion into the trachea of a patient;
a tubular member insertable in said chest tube and defining a passage through which a sampling catheter can be passed into the trachea;
a plurality of longitudinal outwardly projecting webs on said tubular member, which are engageable with the inner walls of the chest tube and serve to hold the passage in the tubular member spaced away from the inner wall of the chest tube;
and stop means for preventing the insertion of the tubular member through the chest tube beyond a predetermined point.

4,170,233

DEVICE FOR CORRECTING THE POSTURE OF A HUMAN FOOT

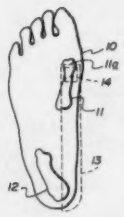
Gordon E. Bunsick, R.R. 3, Bath, Ontario, Canada (K0H 1G0)

Filed Mar. 16, 1978, Ser. No. 887,053

Claims priority, application Canada, Feb. 7, 1978, 296377

Int. Cl.[2] A43B *7/14*

U.S. Cl. 128—586 **5 Claims**



1. A device for correcting the posture of a human foot, said device adapted for placement upon or within a foot-supporting insole structure and comprising an elongated substantially rectangular pad having a first area of substantially uniform thickness and a second area of a relatively greater thickness, a rearward end region of said pad being part of said first area of substantially uniform thickness and adapted to support a medial inner one third of the calcaneous bone of said foot and a forward end region containing said second area of relatively greater thickness adapted to support the surgical neck region of the first metatarsal bone of said foot, the thickness of said first area being such that said calcaneous bone is tilted at an angle of between $2\frac{1}{2}°$ and $8\frac{1}{2}°$ with respect to the major plane of said insole structure and the forward region of said foot containing the surgical neck regions of the metatarsal bones is tilted through an additional $1\frac{1}{2}°$ to $6\frac{1}{2}°$.

4,170,234

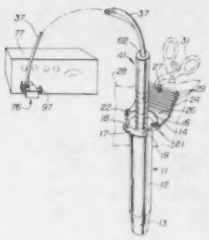
SYSTEM FOR USE WITH ELECTRO-SURGICAL PENCIL

Raymond Graham, Mountain View, Calif., assignor to Dytek Corporation, Mountain View, Calif.

Filed Oct. 11, 1977, Ser. No. 841,035

Int. Cl.[2] A61B *17/36*; A61N *3/06*

U.S. Cl. 128—303.14 **10 Claims**



1. An electro-surgical pencil comprising an elongated hollow casing having first and second openings at opposite ends of said casing, an electrically conductive electrode fitting into said first opening, a conductive blade receiver in said casing establishing electrical contact with the end of said electrode within said first opening, first, second and third parallel, substantially co-planar stiff wire busses extending longitudinally within said casing, means on said casing for supporting said busses at opposite ends thereof with said busses unsupported at their middles, said second buss electrically connected to said blade receiver, a cord extending into said second opening of said casing having first, second and third insulated conductors connected to said first, second and third busses, respectively, a switch body, said casing formed with slots vicinal the middles of said busses, said body having first and second longitudinally opposed finger control projections extending from the interior of said casing out through said slots said body having fulcrums on either side engaging said casing and enabling said body to pivot when one said projection is manually depressed, a resilient, conductive member formed of a sheet of thin metal fixed to said body, said member having slanted fingers centrally disposed at either end, one said finger continuously engaging said second buss, said member having an integral first contact at a first end laterally offset in a first direction and an integral second contact at a second end opposite said first end laterally offset in a second direction opposite said first direction, said first and second contacts overlying said first and third busses, respectively, said fingers biasing said body to neutral position with neither of said contacts electrically engaging a buss, said body being pivotally mounted in said casing by said fulcrums for a toggle action whereby said first contact engages said first buss when said first projection is depressed, said second contact engages said third buss when said second projection is depressed and neither said first or second contact engages a buss when neither projection is depressed and said body is in neutral position.

9. An adaptor to connect a cord for an electro-surgical pencil to an electrical pulse generating machine, said cord having at least two insulated conductors, comprising contact means to establish electrical contact with said pulse generating

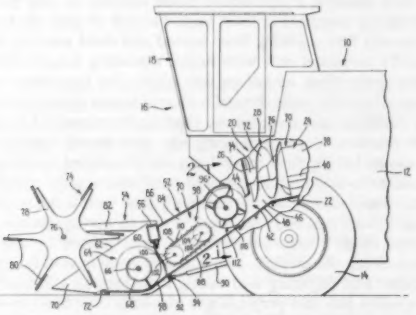
means, means forming a receptacle for the end of said cord remote from said pencil, at least two pins reciprocable in said adaptor, manually actuated means for moving said pins to pierce the insulation of said conductors when in said receptacle and establish electrical contact with said conductors, and means to establish electrical contact between an individual one of said pins and said contact means, and cooperable cam means on said adaptor and said manually actuated means, said manually actuated means being movable between a first and a second position, said manually actuated means engaging ends of said pins remote from said conductors, said cam means moving said manually actuated means from first position with said pins out of contact with said conductors to a second position with said pins piercing the insulation of said conductors.

4,170,235

AXIAL FLOW COMBINE HARVESTER

Robert Ashton, Islington, and Wilbert D. Weber, Mississauga, both of Canada, assignors to Massey-Ferguson Industries Limited, Toronto, Canada

Filed Nov. 10, 1977, Ser. No. 850,434
Int. Cl.[2] A01F *12/18*
U.S. Cl. 130—27 T **10 Claims**



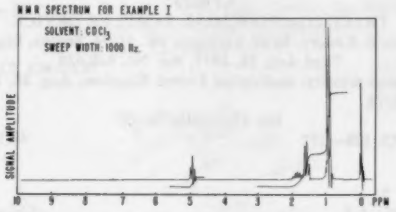
1. An axial flow combine harvester with a frame, ground engaging wheel means supporting the frame, a tubular casing mounted on the frame, an axial flow threshing and separating rotor rotatably mounted on the frame in the tubular casing, a crop inlet in the lower portion of the tubular casing adjacent one end of the threshing and separating rotor, and feed means capable of feeding crop material through the crop inlet in the tubular casing to the axial flow threshing and separating rotor characterized by an auger beater with shaft means at the ends thereof rotatably journaled on the frame adjacent the crop inlet in the tubular casing on the axis of rotation in a plane that is generally perpendicular to the axis of rotation of the rotor, said beater including at least one spiral flight section with a right hand helix and at least one spiral flight section with a left hand helix and drive means to rotate the auger beater so as to move the crop material centrally and; away from the ends thereof, under the axis of rotation of the auger beater and through the crop inlet in the tubular casing and to the axial flow threshing and separating rotor.

4,170,236

ISOBUTYL SUBSTITUTED HETEROCYCLIC COMPOUNDS AND USES FOR AUGMENTING OR ENHANCING THE ORGANOLEPTIC PROPERTIES OF SMOKING COMPOSITIONS

Donald A. Withycombe, Lincroft; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust, and Joaquin F. Vinals, Red Bank, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 807,056, Jun. 16, 1977, Pat. No. 4,093,752.
This application Mar. 17, 1978, Ser. No. 887,625
Int. Cl.[2] A24B *3/12*; A24D *1/18*
U.S. Cl. 131—2 **2 Claims**



1. A composition useful in augmenting or enhancing the aroma and taste of a smoking composition comprising (i) a smoking composition flavor augmenting or enhancing quantity of 2,4,6-triisobutyl-1,3,5-trioxane in combination with a smoking composition; and (ii) the remainder of said formulation being at least one adjuvant selected from the group consisting of:

Beta-ethyl-cinnamaldehyde;
Eugenol;
Dipentene;
Damascenone;
Maltol;
Ethyl maltol;
Delta undecalactone;
Delta decalactone;
Benzaldehyde;
Amyl acetate;
Ethyl butyrate;
Ethyl valerate;
Ethyl acetate;
2-Hexenol-1;
2-Methyl-5-isopropyl-1,3-nonadiene-8-one;
2,6-Dimethyl-2,6-undecadiene-10-one;
2-Methyl-5-isopropyl acetophenone;
2-Hydroxy-2,5,5-8a-tetramethyl-1-(2-hydroxyethyl)-decahydronaphthalene;
Dodecahydro-3a,6,6-9a-tetramethyl naphtho(2, lb)-furan;
4-Hydroxy hexanoic acid, gamma lactone;
Polyisoprenoid hydrocarbons;
Celery seed oil;
Coffee extract;
Bergamot oil;
Cocoa extract;
Nutmeg oil; and
Origanum oil.

4,170,237

WATER PIPES WITH MEANS FOR PREVENTING WATER SPILLAGE

Kevin B. Epstein, 2775 Roscomare Rd., Los Angeles, Calif. 90024

Filed Aug. 26, 1977, Ser. No. 827,881
Int. Cl.[2] A24F *1/14*
U.S. Cl. 131—173 **19 Claims**

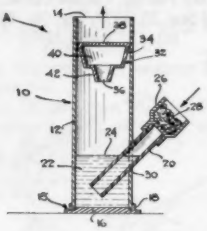
1. A water pipe comprising:

(a) a first elongate hollow tube having an open upper end and a closed lower end providing a water chamber and a smoke accumulating chamber above said water chamber,

(b) a second elongate hollow tube extending through said first tube and having a lower end terminating in said water chamber of said first tube,

(c) a means for retaining a burnable grown plant substance on the outer end of said second tube such that smoke from said burnable substance when ignited can pass through said second tube through water in said water chamber into said smoking accumulating chamber,

(d) water entrapment means located in said first tube and comprising an elongate tubular member having an engagement portion extending fully around the periphery thereof in water sealing contact with the interior surface of said first elongate tube to prevent water in the water chamber from passing between the tubular member and the interior surface of said first tube, said water entrapment means also



comprising a wall extending across a portion of said elongate tubular member generally transversely to said first elongate hollow tube and said elongate tubular member, said tubular member and said wall cooperating with the interior surface of said first elongate hollow tube to form a water entrapment area to collect water if the pipe is tipped over, and

(e) means forming an opening through said wall of said water entrapment means so that smoke can be withdrawn from said smoke accumulation chamber but which is located so that water will accumulate in the water entrapment area if said pipe is tipped over, said opening being located relative to the amount of water in said water chamber so that water will not pass through said opening if said pipe is tipped over.

4,170,238

SMOKER'S TOOL INCLUDING A TOBACCO-PRESSER MEANS FOR PRESSING DOWN LIGHTENED TOBACCO IN A PIPE

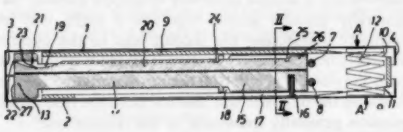
Herbert Marti, Unterrutistrasse 1, Langnau am Albis, Switzerland

Filed Jun. 15, 1977, Ser. No. 806,928

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628740

Int. Cl.[2] A24F *9/02*

U.S. Cl. 131—243 **31 Claims**



1. A smoker's tool comprising an elongated slidable element having axially opposite end portions, means for housing said elongated element, said housing means including a pair of housing bodies which in a first closed position define an elongated chamber for completely housing said elongated element, means for pivoting one of said housing bodies relative to another of said housing bodies for movement between said first closed position and a second open position at which said elongated element projects at least partially beyond said housing means, and cooperative means between at least one of said housing bodies and said elongated element for locking said elongated element in said second position and preventing the sliding return of said elongated element into said chamber.

4,170,239

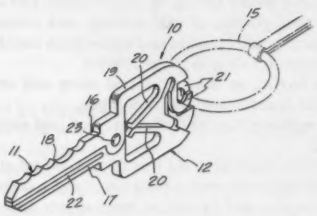
CIGARETTE HOLDER

John Herman, 3060 Belden Dr., Los Angeles, Calif. 90068

Filed Apr. 20, 1978, Ser. No. 898,395

Int. Cl.[2] A24F *13/22*

U.S. Cl. 131—257 **3 Claims**



1. A cigarette holder, comprising:

first and second metal members, each having a shank and a head portion, said members being arranged in overlying relation with the shanks of each contacting the other;

a pivot pin interrelating said metal members for rotative movement thereabout;

springlike means integral with the head portions continuously urging the head portions away from each other and the shank portions toward each other; and

said head portions having respective generally C-shaped members overlying one another to form an attachment opening;

said C-shaped members and the shanks respectively moving away from each other when the head portions are forced toward each other, whereby the so formed space between the shanks provides means for gripping a cigarette and the space between the C-shaped members provides means for attachment of the holder to an external means.

4,170,240

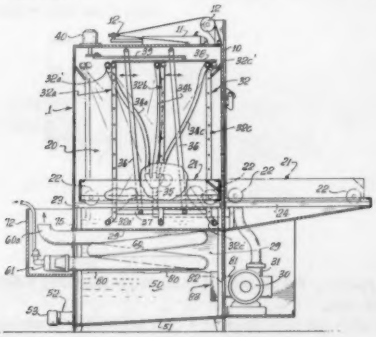
PARTS CLEANING MACHINE

Richard W. Gentry, 8192 Tokay, Fontana, Calif. (92335)

Filed Nov. 1, 1977, Ser. No. 847,589

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—57 R **2 Claims**



1. In a parts cleaning machine:

a cabinet having a door in its front wall portion,

a horizontal pan dividing said cabinet into a spray chamber and a sump compartment below the chamber,

wheel tracks within said chamber and extending outwardly beyond said door for loading,

a parts tray having supporting wheels adapted to engage said tracks,

a spray cage comprising a plurality of generally rectangular spaced loops of pipe with nozzles facing inwardly, said loops being rigidly connected by an upper strap member along the top and lower strap members disposed at each side,

swing rods pivoted to said lower strap members and to the upper side portions of said cabinet to form a swingable parallel linkage,

a low-speed motor having an output crank and mounted on the upper portion of said cabinet, and connecting rods connecting said crank to said upper strap member to cause said cage to swing in reciprocation,

a pump having an inlet from said sump and an outlet via flexible hoses to said loops of pipes,

a drain opening from said chamber into said sump compartment,

an inlet box attached to the rear of said cabinet and comprising an inlet tank with a float valve and a connection to a fluid supply, and having an opening into said sump compartment,

a heating flue in the upper portion of said sump compartment with a substantial space below said flue for the accumulation of sludge, and

a cleanout trap at the bottom rear portion of said sump compartment, the bottom of said compartment sloping downward toward said trap.

4,170,241

APPARATUS FOR CLEANING CONTAINERS

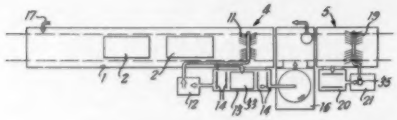
John W. M. Clapp, Luton, England, assignor to Thermoplastic Compounders Limited, Luton, England

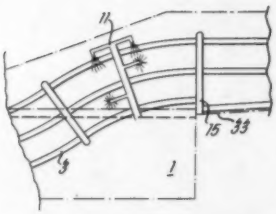
Filed Mar. 14, 1978, Ser. No. 886,606

Claims priority, application United Kingdom, Mar. 15, 1977, 10998/77

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—83 **15 Claims**





1. Apparatus for cleaning containers comprising a detergent solution tank,

a set of guide rails defining a channel for the containers, the channel having an inlet section outside the tank, an immersion section wholly below the surface of the liquid when the tank is filled, and an outlet section,

a pusher system means for pushing a sequence of containers sequentially and each pushing the next through the channel,

at least one ultrasonic transducer mounted on the base of the tank,

means for driving the transducer to impart ultrasonic vibratory energy to liquid in the tank,

a rinsing device downstream of the tank and adapted to spray liquid on containers emerging from the tank,

means for heating liquid in the tank to an elevated temperature and maintaining the liquid at that temperature, and

means for withdrawing a portion of liquid from the tank, removing suspended solids therefrom and returning the liquid to the tank.

4,170,242

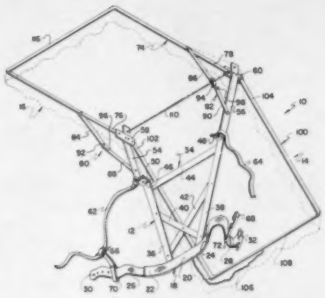
BODY SUPPORTED CANOPY

Felipe S. Caso, 1182 Florida, Corpus Christi, Tex. 78404

Filed Sep. 30, 1977, Ser. No. 838,218

Int. Cl.[2] A45B *11/02*

U.S. Cl. 135—5 C **3 Claims**



1. A body carried canopy comprising

a body carried support including a waist band having a generally concave section having an open side and a belt end secured to opposite sides of the concave section, an upstanding framework affixed to the concave section having a first pair of upstanding members on opposite sides of the section providing generally parallel first flat surfaces extending in a plane tangent to the concave section and a second pair of upstanding members comprising extensions of the first upstanding members and having second flat surfaces generally perpendicular to the first surfaces, and a pair of shoulder straps secured to the framework;

an articulated canopy frame including a first generally U-shaped member having generally first legs and a bight, means pivotally connecting the first legs to the upstanding members for movement in a path between a position generally parallel to the framework adjacent the concave side of the section and a position generally transverse to the framework, a second generally U-shaped member having generally parallel second legs and a bight, and means pivotally connecting the second legs to the upstanding members independently of the first legs for movement in a path between a position generally parallel to the framework on the opposite side thereof from the first legs and a position generally transverse to the framework;

means for supporting the first U-shaped member in a position generally transverse to the framework and means for deactivating the supporting means for allowing the first U-shaped member to move to a position generally parallel to the framework, the supporting means comprises a pair of toggle braces connecting each leg of the first U-shaped member to adjacent second upstanding members of the framework for movement in a path generally parallel to the second upstanding members;

the second U-shaped member being free to move between a

position generally transverse to the framework and a position generally parallel to the framework; and

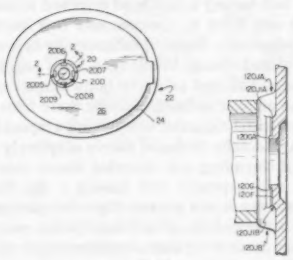
a bodily flexible non-transparent cover having a first planar section supported by the first U-shaped member and a second planar section supported by the second U-shaped member.

4,170,243

PRESSURE RELIEF VALVE FOR PRODUCT CONTAINERS

Simon J. Richter, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 739,397, Nov. 18, 1976, Pat. No. 4,140,148.
This application Aug. 31, 1978, Ser. No. 938,717
Int. Cl.[2] F16K *15/02*
U.S. Cl. 137—240 **6 Claims**



1. Sanitary pressure relief valve and lid means for liquid product containers comprising:

a central web in said lid having a raised annular valve seat surface formed therein and a relief port through said valve seat surface and said web, said web further comprising an annular intermediate web surface surrounding said raised seat surface;

at least a pair of spaced arcuate bosses integrally formed in said lid and raised above said annular valve seat surface and said intermediate web surface and partially enclosing said intermediate web surface;

a tubular valve body having one end open and its other end integrally affixed to said arcuate bosses and defining, with said bosses, drain ports for communicating the annular web surface with the exterior of said valve body;

valve poppet means selectively closing said relief port seated on said annular valve seat;

valve spring means in said valve body engaged with said poppet;

spring retainer means inserted in said one open end of said tubular valve body maintaining said valve spring means in engagement with said valve poppet means;

said spring retainer means including access ports formed therein for admitting cleaning fluids to the interior of said valve body to sterilize said relief valve assembly; and

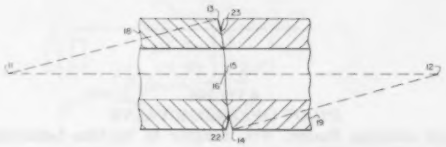
said drain ports acting to drain said cleaning fluids and condensates thereof from said relief valve assembly.

4,170,244

PRESSURE TIGHT VALVE SEAT FOR VALVES CONSISTING OF TWO OPPOSING TUBES

Henry J. Bernaerts, R.F.D. 10, Box 1610, Laurel La., Annapolis, Md. 21401

Filed Nov. 15, 1977, Ser. No. 851,577
Int. Cl.[2] G05D *16/00*
U.S. Cl. 137—83 **7 Claims**



1. A fluid jet transfer valve comprising:

two tubes with at least one of the tubes being a cantilevered tube, the cantilevered tube having a stationary end and a movable end, each of the two tubes having an open end with the movable end of the cantilevered tube also being the open end, and with the open ends being positionable to engage each other;

a source of pressurized fluid connected to one of the tubes;

a lateral deflection means for producing relative movement between the open ends of the tubes with the movements of the tube ends being restricted to paths which lie within a single plane surface and which are approximately arcs of tangent but non-overlapping circles with the arcs passing through a central point where the open tube ends are coaxially aligned with each other;

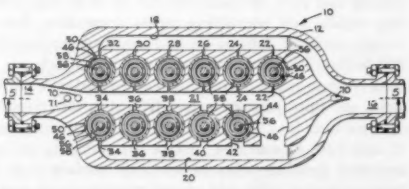
tube end surfaces on each of the open tube ends with the positions of the tubes adjusted so that the open tube ends will be in firm contact when coaxially aligned with each other, with the tube end surfaces tilted so that the open tube ends will be free to move apart without binding against each other, with the tube end surfaces formed with complementary shapes so as to produce a tight seal between the two open tube ends when they are coaxially aligned with each other and with almost all of each said tube end surfaces on each said open tube end being positioned along the intersection of the tube with two semicylindrical surfaces which are perpendicular to the plane surface within which the open tube end moves when it is laterally deflected, with approximately half of each tube end surface being concave relative to the rest of the tube and approximately half of each tube end surface being convex relative to the rest of the tube such that the tube ends may move away from each other in one direction but cannot pass each other.

4,170,245

DIGITAL CONTROL VALVE

Frank P. Haley, Upland, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 3, 1978, Ser. No. 883,423
Int. Cl.[2] G05D *7/03*
U.S. Cl. 137—487.5 **10 Claims**



1. A valve having a valve body with an inlet opening and an outlet opening, a first passage in communication with said inlet

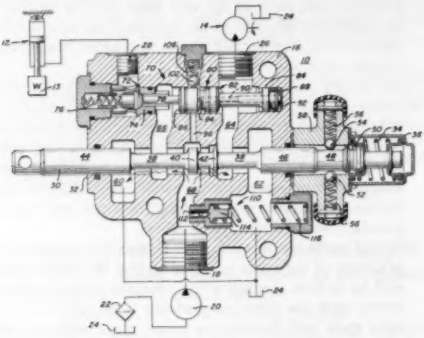
opening and a second passage in communication with said outlet opening, a plurality of slots of rectangular cross-section connecting said first and second passages, means defining a bore intersecting each of said slots, and a piston in each bore shiftable between a slot-open and a slot-closed position, and means to shift selected pistons to the slot-open position to provide a flow path of predetermined area between the inlet opening and the outlet opening.

4,170,246

PILOT OPERATOR VALVE

Gary Johnson, Racine, Wis., assignor to Sta-Rite Industries, Inc., Racine, Wis.

Filed May 23, 1977, Ser. No. 799,682
Int. Cl.[2] F15B *11/08, 13/043*
U.S. Cl. 137—596.12 **9 Claims**



1. A valve for directing fluid from a pressurized fluid source to a fluid operated motor and to a fluid actuated work member comprising:

a housing;

an inlet port in fluid communication with said source;

a first outlet port in fluid communication with said work member;

a second outlet port in fluid communication with said motor;

first passage means for communicating said inlet port with said first and second outlet ports;

means mounted in said first passage means for selectively directing fluid from said inlet port to one of said first and second outlet ports in response to operation of said fluid directing means;

said second outlet port being unobstructed,

means for controlling fluid flow through said first outlet port, said controlling means including a pilot operated member positioned in a bore in said housing, said pilot operated member including means for interacting with said fluid to develop a force for actuating said pilot operated member to open said controlling means and for deactuating said pilot operated member to close said controlling means; said interacting means comprising first and second surfaces defined on said pilot operated member and being of different cross sectional areas and;

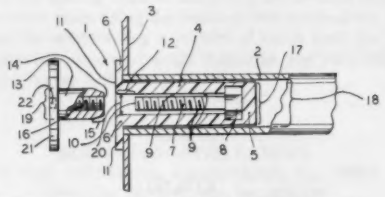
second passage means for communicating said bore with said fluid, and third passage means defined in said pilot operated member for communicating said fluid communicated to said bore to said first surface for actuating said pilot operated member, wherein said first surface is in fluid communication with said second passage means and said second surface is in fluid communication with said first outlet port.

4,170,247

POLYFLUOROCARBON CONDENSER PLUG

John Bates, 3856 New Hope Rd., Grants Pass, Oreg. 97526

Filed Oct. 25, 1977, Ser. No. 844,795
Int. Cl.[2] F16L *55/10*
U.S. Cl. 138—89 **3 Claims**



1. In a condenser plug for a condenser tube, the combination comprising:

a cylindrical external tube body having a thermoplastic polymer composition adapted to thermoplastic cold flow extrusion and sealing at the coadenser tube operational conditions, said tube body having a coaxial flat flange lip at one tube terminus and an integral plug base at the second tube body terminus, said tube body having

a threaded bolt coaxially disposed inside said tube body, said threaded bolt having a bolt head disposed in said integral plug base and fixed in position, said bolt having a bolt terminus adaptively disposed substantially below the exterior face of said coaxial flat flanged lip of said tube body, said threaded bolt and said tube body adaptively sized to provide an annular cylinder volume there between, and,

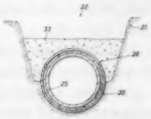
a cooperative metal expander bolt having a tapered insertion tip and an internally threaded sleeve adaptively providing a means of threading said threaded sleeve onto said bolt terminus, said expander bolt having a flat flange head whose diameter is not greater than the diameter of said coaxial flat flanged lip of said tube body, said expander bolt having an exterior bolt diameter adaptively sized to provide thermoplastic cold flow expansion and extrusion of said polymer composition to conform to the mechanical and thermal stresses for a specific cold flow sealing operation, sealing said condenser tube.

4,170,248

METHOD FOR REPAIRING SEWER PIPES

Robert B. Bennett; Warren C. McMordie, Jr., and William H. Taylor, all of Houston, Tex., assignors to Oil Base, Inc., Houston, Tex.

Filed Feb. 5, 1976, Ser. No. 655,623
Int. Cl.[2] F16L *55/18*
U.S. Cl. 138—97 **4 Claims**



1. In a method for repairing a substantially horizontal sewer pipe, which has an upstream portion and a downstream portion, wherein a flexible liner is inserted within the sewer pipe, said flexible liner having an outer diameter less than the inner diameter of said sewer pipe; the flexible liner is supported in a spaced relationship from the sewer pipe, whereby an annular space is formed between the flexible liner and the sewer pipe, and the annular space is filled with cement, the improvement comprising,

(a) filling the annular space by digging a hole about the sewer pipe at the upstream portion of the sewer pipe, removing a section of the upper half of the sewer pipe, and

filling the hole with cement to a sufficient height to form a hydrostatic head, whereby the hydrostatic head will cause the cement to flow into the annular space, thereby filling the annular space as the cement flows downwardly to the downstream portion of the sewer pipe,

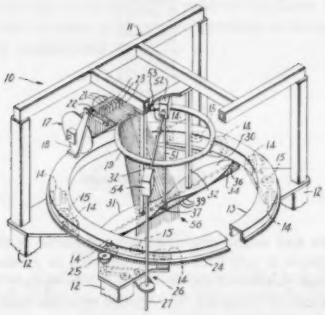
(b) the cement comprising a low viscosity magnesium based cement selected from the group consisting of magnesium oxychloride cement and magnesium oxysulfate cement, whereby the liner is bonded to the sewer pipe and point-load collapsing of the sewer pipe is prevented.

4,170,249

WARP LENGTH COMPENSATOR FOR A TRIAXIAL WEAVING MACHINE

Wayne C. Trost, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Sep. 25, 1978, Ser. No. 945,758
Int. Cl.² D03D *41/00*
U.S. Cl. 139—11 **9 Claims**



1. A warp length compensator in a weaving machine having a pair of opposed parallel weftwise rows of heddles for guiding warp strands arranged in two sheets to form alternate warp sheds, the heddles in said opposed rows of heddles being shifted weftwise in opposite directions such that the warp strands in one of said sheets cross the warp strands in the other of said sheets, the leading heddle in each of said opposed row of heddles being transferred to the trailing position in the other of said rows of heddles, a creel supplying ends of yarn, and means for rotating said creel about an axis perpendicular to said rows of heddles in the direction of and in timed relation to the shifting and transferring of said heddles, said compensator comprising a yarn ring parallel to and concentric with said creel for guiding therethrough an end of yarn passing from the creel and, as a warp strand, to a respective one of said heddles, a fixed track intermediate the yarn ring and said rows of heddles, parallel portions of said track extending weftwise substantially coextensive with said rows of heddles, short connecting portions of said track joining the adjacent ends of said parallel portions, a movable yarn separator for guiding said yarn end, means for moving said yarn separator around said track in timed relation to the shifting and transferring of said one of said heddles, and a fixed cam for deflecting the end of yarn intermediate the yarn ring and said yarn separator such as to maintain a fixed length of said yarn end between the yarn ring and said yarn separator.

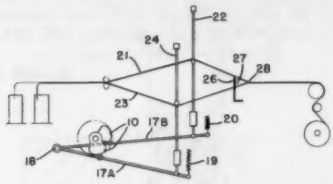
4,170,250

LOOM HARNESS MECHANISM

Arthur C. Farley, Jr., Greensboro, N.C., assignor to Cone Mills Corporation, Greensboro, N.C.

Filed Jan. 17, 1977, Ser. No. 759,966
Int. Cl.² D03C *5/04*
U.S. Cl. 139—79 **3 Claims**

1. A loom mechanism for delaying the harness crossing during the weaving cycle comprising a pair of cams, said cams having sides and a surrounding outer camming surface, said camming surface forming at least one lobe on each side of the cam, said first cam lobe being of a lower vertical height than said second cam lobe, pivotable treadles engaging said cams'



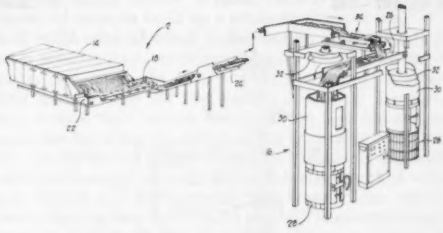
outer camming surfaces, a harness assembly joined to said treadles, said harness assembly having at least two crossable harness members each for supporting different warps of yarn, said cams' outer camming surfaces being contoured allowing said harness members to cross between 310°–330° of the weaving cycle.

4,170,251

METHOD AND APPARATUS FOR DETERMINING THE WEIGHT AND MOISTURE CONTENT OF MATERIALS

Edwin W. Hine, II, Philadelphia, Pa., assignor to Proctor & Schwartz, Inc., Philadelphia, Pa.

Filed Nov. 3, 1976, Ser. No. 738,638
Int. Cl.² B65B *1/30*
U.S. Cl. 141—11 **5 Claims**



4. In a method for processing tobacco wherein the tobacco is submitted continuously to the successive steps of drying and remoistening at one station, and then packing in a suitable shipping container at a station remote from the drying and remoistening station, the improvement for controlling the weight of tobacco fed to a shipping container comprising continuously producing a signal proportionate to the weight of the tobacco and simultaneously therewith its moisture content immediately prior to introducing the same into said shipping container.

4,170,252

VARIABLE FLOW FUNNEL CONSTRUCTION

Gary J. Peterson, P.O. Box 822, Homer, Ak. 99603

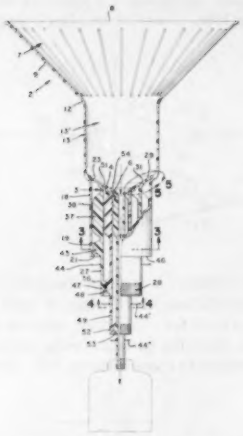
Filed Jul. 13, 1978, Ser. No. 923,935
Int. Cl.² B67C *11/00*
U.S. Cl. 141—331 **15 Claims**

1. A variable flow funnel construction comprising:

(a) a primary shell structure including a hollow shell portion integral with and communicating with a delivery tube portion; and

(b) at least one shell insert adapted to fit coaxially within the

delivery tube portion of said primary shell and selectively adjustable in relation thereto to provide a space therebe-



tween or seal said space to control the flow of liquid through the funnel.

4,170,253

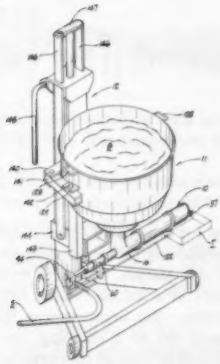
BAKERY MIX DISPENSER HAVING PUMP ACTUATED OUTLET GATE

Donald A. McArthur, 4310 Arco, St. Louis, Mo. 63110

Filed Apr. 19, 1976, Ser. No. 678,026

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—362 **8 Claims**



1. A dispensing device for dispensing a bakery mix from a mixing bowl having a discharge port, the device comprising:

(a) a dispensing chamber disposed below the discharge port and including a dispensing port,

(b) means connecting the discharge port and the dispensing chamber,

(c) plunger means mounted in the dispensing chamber,

(d) actuating means moving the plunger means in the dispensing chamber to operatively dispense mix from the dispensing port during a dispensing stroke, and

(e) the actuating means including piston and cylinder means said piston being operatively connected to the plunger means, and means moving said piston and said plunger means toward and away from the dispensing port said means including valve means manually actuated to supply air to the cylinder to move the piston in one direction and actuated by operative engagement with the piston to supply air to the cylinder to move said piston in the other direction.

4,170,254

TIRE WITH A STRAIGHT SIDEWALL

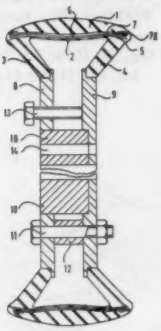
William L. Jackson, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Continuation of Ser. No. 603,808, Aug. 12, 1975, abandoned. This application Apr. 22, 1977, Ser. No. 790,151

Claims priority, application United Kingdom, Aug. 23, 1974, 37159/74

Int. Cl.[2] B60C *19/00*

U.S. Cl. 152—353 R **44 Claims**



1. A tire and wheel rim assembly, operable without pneumatic pressure in said tire, said tire having in cross-section:

(a) a tread portion defining the outer periphery of the tire and a pair of sidewalls of a harder material than said tread portion extending axially and radially inwardly therefrom and terminating in bead portions for seating on a rigid wheel rim, the section midline of each sidewall being substantially straight, the tread portion having an axial width greater than the remainder of the tire so as to define a tire having a generally triangular cross-section;

(b) a laterally inextensible reinforcing belt under substantially the entire width of the tread portion;

(c) the thickness of the tire between the belt and the outer periphery being greater at the central area of the tread than at its edges and the belt never being outwardly convex toward the tread so that the edges of the belt will move toward each other when the belt is deflected by contact with the ground;

(d) circumferentially inextensible reinforcement means located radially outwardly of the sidewalls and the inner surface of the belt and at least adjacent each edge of the belt to restrain radial expansion of the sidewalls when said tire is mounted on the rigid wheel rim; and

(e) the rigid wheel rim having a pair of seats for the bead portions of the sidewalls, said rim being sized with respect to the bead portions so as to result in compression of the sidewalls between the rim and the circumferentially inextensible reinforcement means when the tire is mounted on the rim by seating the bead portions on the bead seats, thereby maintaining the belt in tension in the axial direction of the tire since the reinforcing means are located radially outwardly of the sidewalls and the inner surface of the belt and at least adjacent each edge of the belt, said sidewalls having a ratio of thickness to length sufficient for their straight configuration to be maintained in their compressed state.

31. A tire, operable without pneumatic pressure and mountable on a rigid wheel rim, comprising:

(a) a tread having a convex outer surface;

(b) a reinforcing belt beneath said tread, the tread-facing surface of said reinforcing belt being outwardly non-con-

vex, said reinforcing belt being substantially inextensible in the direction of the axis of said tire;

(c) substantially straight sidewalls extending inwardly from beneath from said tread toward said rim so as to define a tire having a generally triangular cross-section, said sidewalls being of harder material than said tread;

(d) circumferentially inextensible reinforcement means located radially outwardly of the sidewalls and the inner surface of the belt and at least adjacent each edge of the belt to restrain radial expansion of the sidewalls when said tire is mounted on the rigid wheel rim;

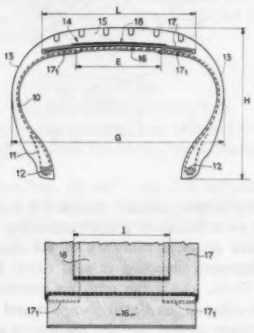
(e) the length of said sidewalls and the size of said rim being such that, after mounting said tire on said rim, each sidewall is compressed between said rim and said circumferentially inextensible reinforcing means, thus creating and maintaining said reinforcing belt in tension in the axial direction of said tire since the reinforcing means are located radially outwardly of the sidewalls and the inner surface of the belt and at least adjacent each edge of the belt, said sidewalls having a ratio of thickness to length sufficient for their straight configuration to be maintained in their compressed state.

4,170,255

PNEUMATIC TIRES

Henri Greiner, Conflans Ste Honorine, and Claude LeFaucheur, Paris, both of France, assignors to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes, Colombes, France

Filed Jan. 18, 1978, Ser. No. 870,490
Claims priority, application France, Jan. 18, 1977, 77 01372
Int. Cl.[2] B60C *9/18*
U.S. Cl. 152—361 FP **6 Claims**



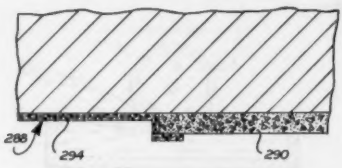
1. In a pneumatic tire suitable for high speed use in which the ratio of the cross-sectional height of the tire to its cross-sectional width is equal to or less than 0.8 and of the kind having a radial carcass and a crown belt interposed between said radial carcass and the tire tread for the width of the tread surface, said belt being formed from two main plies of unequal width composed of high modulus flexible cords which are orientated in opposite directions at small angles, one at least of said plies having its lateral edges folded over and flattened against one face of the belt, the invention which consists in that a third, narrower, belt ply is positioned on the other face of said belt which is opposite to said face having the folded portions against the central part of said ply whose edges are folded.

4,170,256

MOLD ASSEMBLY AND METHOD OF MAKING THE SAME

William S. Blazek, Valley City; Thomas S. Piwonka, Solon; James D. Jackson, and Philip N. Atanmo, both of Cleveland Heights, all of Ohio, assignors to TRW Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 653,383, Jan. 29, 1976, Pat. No. 4,066,116. This application Aug. 29, 1977, Ser. No. 828,492
Int. Cl.[2] B22C *9/04, 9/22*
U.S. Cl. 164—26 **8 Claims**



1. A method of making a mold assembly having portions of different thicknesses and different heat transfer rates, said method comprising the steps of providing a plurality of separate disposable patterns each of which has a surface area with a configuration similar to a portion of a surface area of a product, at least partially coating each of the disposable patterns with a wet covering of ceramic mold material while maintaining the patterns separate from each other, drying the wet covering on the separate patterns, repeating the coating and drying steps with a first one of the plurality of patterns a first number of times to build up a relatively thick covering of ceramic mold material on the first pattern, repeating the coating and drying steps with a second one of the plurality of patterns a second number of times which is less than the first number of times to build up a relatively thin covering of ceramic mold material which is disposed on the second pattern and is separate from the relatively thick covering on the first pattern, separating the relatively thick covering of ceramic mold material from the first pattern to provide a relatively thick walled mold section having a first heat transfer rate, separating the relatively thin covering of ceramic mold material from the second pattern to provide a relatively thin walled mold section which is separate from the relatively thick walled mold section and has a second heat transfer rate which is greater than the first heat transfer rate, and interconnecting the relatively thick and thin walled mold sections to at least partially form the mold assembly.

4,170,257

METHOD AND APPARATUS FOR PRODUCING FILAMENTARY ARTICLES BY MELT EXTRACTION

Robert B. Pond, Sr., Westminster; John M. Winter, Jr., New Windsor, and Bruce S. Tibbetts, Taneytown, all of Md., assignors to National Standard Company, Niles, Mich.

Filed Mar. 3, 1978, Ser. No. 883,172
Int. Cl.[2] B22D *11/06*
U.S. Cl. 164—87 **28 Claims**

1. In a method of melt extraction wherein a solid filamentary article is formed from a bath of molten material having a given surface level by rotating the chill surface of a quench wheel against the surface of the bath to solidify and remove a cresting wave of molten material therefrom, the improvement comprising:

(a) disposing a baffle within the bath wherein at least a majority of the uppermost surface of the baffle is at or below the surface level of the bath; and

(b) rotating the chill surface of the quench wheel against the surface of the bath to form at least a partially isolated meniscus puddle with the baffle for:

1. stabilizing fluid turbulence created by the rotating quench wheel, and

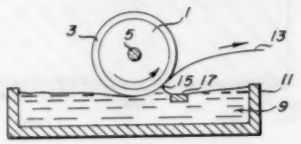
2. maintaining the cresting wave of molten material against the chill surface of the quench wheel during its removal.

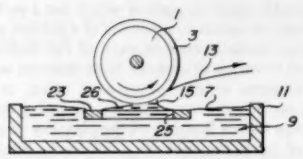
14. An apparatus for melt extraction wherein a solid filamentary article is formed from a bath of molten material, which apparatus comprises, in combination:

(a) a container having side walls of a sufficient height for holding molten material having a given bath level,

(b) a rotatable quench wheel having a peripheral chill surface for solidifying and removing a cresting wave of the molten material from the bath,

(c) means for rotating the quench wheel about its axis of rotation,





(d) means for raising and lowering the quench wheel relative to the bath, and

(e) baffle means disposed within the container such that at least a majority of the uppermost surface of the baffle means is at or below the given bath level whereby an isolated meniscus puddle of molten material is formed upon rotation of the quench wheel against the surface of the bath to thereby

1. stabilize fluid turbulence created by the rotating quench wheel, and

2. maintain the cresting wave of molten material against the chill surface of the quench wheel during its removal.

4,170,258

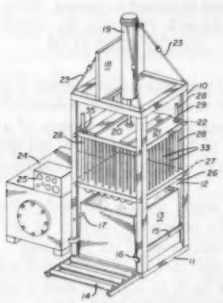
MOLD MAKING MACHINE

William R. Gartland, 236 Elmwood Dr., Hubbard, Ohio 44425

Filed Sep. 23, 1977, Ser. No. 836,082

Int. Cl.[2] **B22C** *9/02, 15/08*

U.S. Cl. 164—187 **7 Claims**



1. In a mold making machine for producing molds for cast welding rods and having a vertical frame with an open area in the bottom thereof for the reception of a sand filled flask and motion imparting means on the upper end thereof; the improvement comprising first and second pressure plates positioned in said vertical frame for vertical movement, a member fixedly connecting the motion imparting means to said first pressure plate and a plurality of spaced pointed small diameter rods attached to the first pressure plate in depending relation thereto and arranged for registry with a plurality of spaced openings in said second pressure plate which is positioned therebelow, interconnecting means between the first and second pressure plates arranged to permit limited relative movement thereof whereby the first pressure plate upon being moved downward by said motion imparting means engages the second pressure plate therebelow and moves the same downwardly into the sand filled flask when the pointed rods have engaged the sand therein so as to form elongated small diameter spaced vertical cavities therein and whereby upward movement of the first pressure plate moves the second pressure plate upwardly away from the sand filled flask when the pointed rods have moved upwardly out of the cavities formed therein by upward movement of said first pressure plate by said motion imparting means.

4,170,259

AIR CONDITIONING DISPLAY SYSTEM FOR VEHICLES

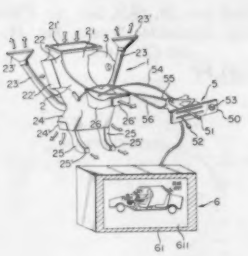
Naotake Kumagai, Aichiken, and Minoru Tatemoto, Ohbu, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1978, Ser. No. 882,144

Claims priority, application Japan, Mar. 23, 1977, 52-31117; Jan. 17, 1978, 53-3453

Int. Cl.[2] **B60H** *1/00;* **B60Q** *11/00;* **G08B** *5/36*

U.S. Cl. 165—11 **33 Claims**



1. An air conditioning display system for a vehicle comprising a vehicle's air conditioner proper including at least a plurality of air intake ducts, a plurality of air discharge ducts, a plurality of dampers disposed in said ducts for closing and opening said ducts, and a fan unit, air conditioner actuating means for actuating at least said dampers and said fan unit in said air conditioner proper thereby regulating a temperature of air discharged out of said discharge ducts, and a display device mounted in said vehicle and including a display panel carrying the picture of the vehicle body portions including at least the front seat and its neighbourhood, said display device comprising a plurality of switch means selectively turned on and off for selectively energizing and deenergizing a plurality of lamps in response to the manipulation of said air conditioner actuating means, whereby said selectively energized lamps provide luminant display of the flowing patterns of air into and out of said air conditioner proper on the portions of said display panel corresponding to the vehicle body portions at which air flows into and out of said air conditioner proper, and temperature switch means for energizing lamps emitting light of cold color when cold air flows out from the duct outlets, and energizing

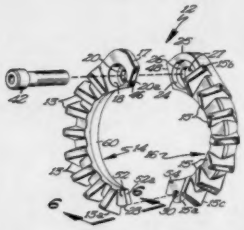
lamps emitting light of warm color when warm air flows out from the duct outlets.

4,170,260

EXHAUST PIPE COOLING CLAMP FOR MOTORCYCLES

Thomas H. Rudd, Wayzata, and James M. Preisler, Bloomington, both of Minn., assignors to Drag Specialties, Inc., Minneapolis, Minn.

Filed Aug. 29, 1977, Ser. No. 828,836
Int. Cl.[2] F28F *9/06*; F16L *19/04, 23/00*
U.S. Cl. 165—51 **15 Claims**



1. A cooling clamp for motorcycle exhaust pipes comprising:

a pair of arcuate collar segments removably interlocked together at their opposite ends and defining together a continuous, annular clamp of arcuate configuration having an inside opening sized to fit snuggly around an exhaust pipe of predetermined diameter;

said collar segments being interlocked together at one end by mating locking heads thereon, one of said locking heads on one collar segment having a circular, male member projecting therefrom generally normal to the plane of said collar segments, and the other one of said locking heads having a female recess thereon in which said male member is removably seated in interlocking engagement therewith; and

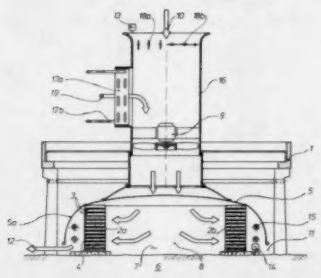
aligned apertures extending through said male member and the female recess in said locking heads for the insertion of a fastener therethrough.

4,170,261

HEAT STORAGE DEVICE

Nikolaus Laing; Ingeborg Laing, and Oliver Laing, all of Hofener Weg 35-37, D 7148 Remseck 2 near Stuttgart, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,648
Claims priority, application Austria, Sep. 24, 1976, 7093/76
Int. Cl.[2] F28D *13/00*
U.S. Cl. 165—104 S **16 Claims**



1. A heat storage device for exchanging heat with a current of air, said device comprising a plurality of vertically stacked thin-walled bendable heat storage members in the form of horizontally extending flat level containers, a meltable heat storage mass contained within each said container, and spacing means forming part of a heat exchanger vertically spacing portions of said containers from each other to form horizontally extending air ducts between said containers for the passage of a current of air therethrough.

4,170,262

GRADED PORE SIZE HEAT PIPE WICK

Bruce D. Marcus, and Donald K. Edwards, both of Los Angeles, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 581,246, May 27, 1975, abandoned.
This application Mar. 7, 1977, Ser. No. 775,343
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—105 **1 Claim**

1. A heat pipe comprising:

a hermetic casing having interior evaporator and condenser regions and a vapor flow space communicating said regions,

a heat transfer fluid within said casing for transporting heat from said evaporator region to said condenser region by a closed thermodynamic cycle involving evaporation of said fluid to the vapor phase in said evaporator region in response to heat input to the latter region, flow of the vapor phase through said flow space to and condensation of the vapor phase to the liquid phase within said condenser region in response to heat rejection from the latter region, and return of the liquid phase to said evaporator region,

a porous capillary structure for conducting said liquid phase from said condenser region to said evaporator region by capillary action,

said porous structure containing a myriad of capillary pores extending throughout the interior of said structure for conducting said liquid phase from said condenser region to said evaporator region and opening through the surface of said structure to said vapor space, whereby pores at said structure surface contain liquid/vapor interfaces, and

the pore size of said porous structure being graded to diminish along said structure from said condenser region to said evaporator region in a manner such that at any given cross section of said structure transverse to the direction of liquid flow through said structure from said condenser region to said evaporator region, said pores are relatively uniformly sized to provide a local capillary-pressure limit at said cross section at least equaling the difference between the liquid pressure in the structure at said cross section and the vapor pressure in said vapor space during heat pipe operation at a given maximum rate of heat transfer.

4,170,263

TUBE SHEET CONNECTION TO VESSEL CONTAINING A BUNDLE OF TUBES

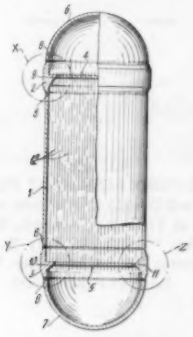
Walter Laber; Rudolf Vogl, both of Deggendorf, and Wolfgang Fahrnschon, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Deggendorfer Werft und Eisenbau GmbH, Deggendorf, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,418

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1976, 2642800

Int. Cl.[2] F28F *9/00*

U.S. Cl. 165—158 10 Claims



1. Tube sheet connection for use in vessels containing a bundle of axially extending tubes, such as heat exchanger and reactors, and particularly for large dimensioned vessels operating under high internal pressure conditions, including a relatively thin membranelike tube sheet extending transversely of the axial direction of said tubes and having a circumferential periphery, and a jacket spaced radially outwardly from said tube sheet and extending in the axial direction of and arranged to laterally enclose said bundle of tubes wherein the improvement comprises an annular reinforcing member secured to and extending around and radially outwardly from the circumferential periphery of said tube sheet, said reinforcing member including an inner part having a radially inner side weld connected to said tube sheet and a radially outer side spaced radially outwardly from said inner side, said inner side having a dimension in the axial direction of said tube corresponding substantially to the thickness dimension of said tube sheet and said outer side having a dimension in the axial direction of said tubes considerably greater than the thickness dimension of said tube sheet, an outer part of said reinforcing member is connected to the outer side of said inner part and extends radially outwardly therefrom, said outer part having a thickness greater than and forming a reinforcing continuation of said jacket, said inner part for a portion thereof in the axial direction of said tubes being frusto-conically shaped and having a surface extending obliquely outwardly from said sheet and said inner part having an increasing thickness in the thickness direction of said tube sheet from the radially inner side to the radially outer side thereof.

4,170,264

PUMP AND ROLL, VEHICLE WITH AN ELEVATABLE WATER TOWER

John C. Gibson, Lawrence, Mass., assignor to Gibson Motor and Machine Service, Inc., Lawrence, Mass.

Filed Jul. 27, 1977, Ser. No. 819,291

Int. Cl.[2] A62C *27/08*

U.S. Cl. 169—24 2 Claims

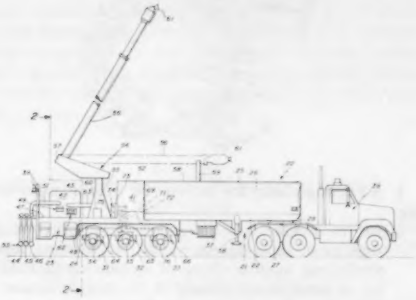
1. A pump and roll, elevatable water tower, vehicle for traveling alongside a moving, burning airplane while pumping liquid, or foam, thereon, said vehicle comprising:

an elongated, wheeled trailer, adapted to be drawn by a motorized tractor, said trailer having an elongated large volume tank, containing fire extinguishing liquid; at least one tank containing fire extinguishing foam, an internal combustion type motor driven pump, a plurality of foam spreader bars and first control valve and conduit means for connecting said tanks and pump to said spreader bars for selectively pumping either water or foam therefrom and

an elevatable water tower, having a base affixed on a central platform proximate the rear of said trailer, a nozzle and an elongated boom pivoted to said base and normally retracted to extend forwardly along, and in substantial parallelism with the top of said elongated water tank,

power means for elevating said elongated boom to upstanding position, while said trailer is being moved by said tractor,

second control valve and conduit means, connecting said



water tower to said first control valve and conduit means, tanks and motor driven pump for selectively pumping fire extinguishing fluid from said nozzle of said boom, while it is erected and said trailer is moving;

the rear wheels of said elongated wheeled trailer including air suspension means on each opposite side of each wheel axle;

air pressure control means connecting the air suspension means on each opposite side of said axles to a source of air pressure and to a control valve on a control valve panel on the control platform of said trailer; and

the air pressure in the air suspension means on the side of said trailer, pushed downwardly out of level, by the reaction of fluid emitted from the nozzle of said elevated tower during movement of said trailer, being increasable by actuation of said control valve to compensate and restore level.

4,170,265

CULTIVATOR

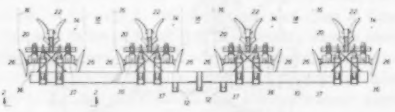
Russell P. Cole, P.O. Box 71, Thibodaux, La. 70301

Filed Feb. 7, 1977, Ser. No. 766,149

Claims priority, application Mexico, Oct. 14, 1976, 166659

Int. Cl.[2] A01B *39/22, 39/02*

U.S. Cl. 172—156 5 Claims



1. Cultivator apparatus comprising:

an elongate main frame;

a plurality of cultivator sub-assemblies spaced along the length of said main frame, each of said sub-assemblies comprising a sub-assembly frame;

a respective first linking means connecting each of said

sub-assembly frames to said main frame for independent non-tilting floating movement of said sub-assembly frame with respect to said main frame in a first direction;

and a respective second linking means connecting each of said sub-assembly frames to said main frame for independent non-tilting floating movement of said sub-assembly frame with respect to said main frame in a second direction transverse to said first direction;

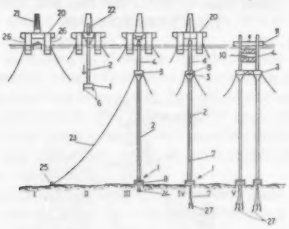
and wherein the first and second linking means for each of said sub-assemblies comprise a first pair of generally parallel link arms spaced from each other in said first direction and a second pair of link arms spaced from each other in said first direction and spaced from said first pair in said second direction, first joint means connecting one end of each of said link arms to said main frame for relative universal movement, and second joint means connecting the other end of each of said link arms to said sub-assembly frame for relative universal movement.

4,170,266

APPARATUS AND METHOD FOR OFFSHORE DRILLING AT GREAT DEPTHS

Jose M. Fayren, Jose Fentanez 19 Pta D Puerta De Hierro, Madrid, Spain (35)

Filed Aug. 10, 1977, Ser. No. 823,263
Claims priority, application Spain, Aug. 11, 1976, 450.616
Int. Cl.[2] E21B *15/02*
U.S. Cl. 175—7 **18 Claims**



1. An installation for the exploitation of underwater oil or other hydrocarbon deposits, especially deposits located in deep water, comprising:

an underwater base disposed on a sea bed;

sharp-edged projection means, located at the underside of said underwater base, for fixing said underwater base on said sea bed; a lower circuit means, accommodating therein a plurality of tubular ducts projecting upwardly from said underwater base to a moderate depth, for reducing the wave action effect at the surface;

an underwater buoy situated at the top end of the lower conduit means and having a certain buoyancy;

an upper conduit which projects upwardly from said underwater buoy to about the level of the sea or thereabove; and

mooring means for securing said underwater buoy to the sea bed and for maintaining said lower conduit means in substantially vertical orientation,

said lower conduit means having a bottom portion extending through said underwater base and being affixed directly into said sea bed,

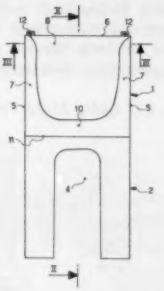
said underwater buoy including well-head control means for drilling into said sea bed.

4,170,267

TOOTH FOR ROTARY DRILLING TOOL FOR DRILLING FOUNDATIONS

Jacques C. Bourlier, 2, rue Félix Faure, 75015 Paris, France

Filed Jan. 31, 1978, Ser. No. 873,971
Claims priority, application France, Feb. 3, 1977, 77 03052
Int. Cl.[2] E21C *35/18*
U.S. Cl. 175—409 **10 Claims**



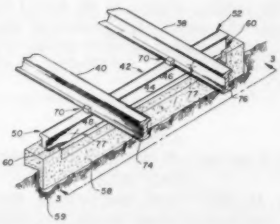
1. A tooth for a rotary drilling tool, especially for an earth tool, for use in drilling in rocky soils, said tooth including a contoured working portion defining a cutting edge and a retaining portion having a U-shaped configuration defining two planar surfaces for mounting said tooth in a tooth carrier formed with a tooth-receiving groove, a central partition and external side faces, wherein said working portion of said tooth is formed with a web having two longitudinal edges, at least one of said longitudinal edges being ribbed and extending along said working portion up to said cutting edge of said tooth, the thickness of said web of said tooth working portion being, in transverse section, smaller than that of said ribbed edge, said ribbed edge protruding in transverse cross-section on both sides of said web and having a free end of a thickness sufficient to receive a tip made from hard material, the longitudinal contour of said web being substantially bevelled.

4,170,268

APPARATUS FOR WEIGHING RAILWAY SUPPORTED VEHICLES

Kjell H. Nordström, and Rune N. A. Flinth, both of Västeras, Sweden, assignors to Flintab AB, Västeras, Sweden

Filed Apr. 22, 1977, Ser. No. 790,100
Int. Cl.[2] G01G *19/04*
U.S. Cl. 177—163 **10 Claims**



1. Apparatus for weighing a rail supported vehicle, said apparatus comprising a pair of spaced apart rails for engaging the wheels of the vehicle and along which the wheels of the vehicle are adapted to roll, at least one longitudinally extending sleeper member comprising a longitudinally extending tubular member extending transversely to and disposed beneath said rails and extending outwardly of both sides thereof, means for supporting the longitudinal end portions of said

longitudinally extending tubular member disposed outwardly of said pair of rails and for allowing deflection of said sleeper member in response to forces applied thereto by said rails, and means for providing a signal which varies as a function of the strain in said sleeper member on the inner surface of said longitudinally extending tubular member.

4,170,269

PRE-LOAD COMPENSATED WEIGHING APPARATUS

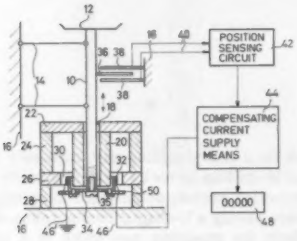
Peter Kunz, Tann-Rüti, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Apr. 21, 1978, Ser. No. 898,949

Claims priority, application Switzerland, May 18, 1977, 6174/77

Int. Cl.[2] G01G *23/14, 7/00*

U.S. Cl. 177—165 **3 Claims**



1. In a weighing system of the electromagnetic compensation type including a frame; load-receiving means connected with said frame for movement from an initial no-load position; permanent magnet means connected with the frame, said permanent magnet means including an air gap; coil carrier means connected with said load-receiving means, said coil carrier means being arranged in said air gap and being formed of insulating material; a compensation coil connected with said load-receiving means in said air gap; means operable when said load-receiving means is displaced, upon the application of a load thereto, from the no-load position for supplying compensating current to said compensation coil to produce an electromagnetic force for returning the load-receiving means to its initial no-load position; dead-load compensating means for compensating for the substantially constant dead-load mass of said load receiving means; and display means responsive to the magnitude of the compensating current for indicating the weight of the applied load:

the improvement wherein said dead-load compensating means comprises:

a plurality of ferromagnetic members connected with said coil carrier means in concentrically arranged radially-extending relation relative to the axis of travel of said load receiving means, said permanent magnet means and said ferromagnetic members having corresponding mutually-compensating temperature coefficients of magnetic performance.

4,170,270

APPARATUS FOR PREVENTING THE OVERLOAD OF A LOAD CELL

Paul R. Sette, Hamden, Conn., and Anthony Storace, Tarrytown, N.Y., assignors to Pitney-Bowes, Inc., Stamford, Conn.

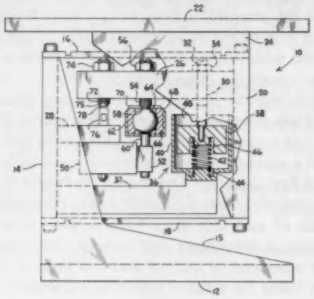
Filed Jun. 26, 1978, Ser. No. 919,088

Int. Cl.[2] G01G *21/10*

U.S. Cl. 177—184 **10 Claims**

1. A weighing scale comprising:

a housing, a movable support structure connected to said housing by a pair of upper and lower spaced apart leaf springs so arranged to form a parallelogram for providing substantially linear motion to said support structure, a weighing pan for receiving a load supported by said support structure, a beam supported by said housing and received within said parallelogram, load cell means secured to said beam, first contact means for providing



engagement between said support structure and said load cell means and second contact means for providing engagement between said beam and said support structure.

4,170,271

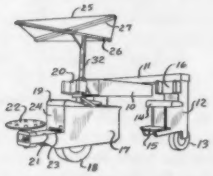
STEERING SYSTEM FOR PERSONNEL CARRIER

Olin L. Looker, c/o The Row Runner Co., Box 29, Milford, Ill. 60953

Filed Dec. 8, 1977, Ser. No. 858,737

Int. Cl.[2] B62D *61/08*

U.S. Cl. 180—211 **6 Claims**



5. Foot-operated steering mechanism for a steerable personnel motorized carrier having a frame, at least one driven ground-engaging wheel and spaced ground-engaging wheels for stabilizing the carrier and its personnel load, comprising:

a housing, said driven wheel secured within said housing and said housing being swingably mounted relative to said carrier frame,

a seat upon the carrier for personnel to be transported,

a platform below and extending forward of the seat in position to rest the feet of a person seated conventionally on said seat, said seat and platform being supported upon and swingable with said housing,

a steering pallet rotatably supported on the platform in position for easy engagement by the foot of said seated person, and

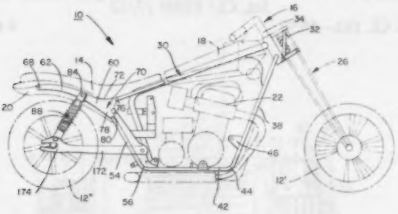
means responsive to rotation of said pallet for wheel steering movement of sufficient of said carrier ground-engaging wheels to effect motion direction of the carrier, whereby the carrier may be steered by foot motion leaving said personnel's hands free.

4,170,272

FRAME FOR A CHOPPER-TYPE MOTORCYCLE

Donald E. Smolinski, 6616 Horseshoe Dr., Clinton, Md. 20735

Filed Feb. 23, 1978, Ser. No. 880,548
Int. Cl.[2] B62K *11/02*
U.S. Cl. 180—227 **9 Claims**



1. A unitary, integral chopper-type motorcycle frame comprising:

an elongate steering head;

a pair of elongate downwardly extending braces connected at one end thereof to said steering head;

a pair of elongate axially extending spanner braces each connected at one end thereof to the other end of one of said downwardly extending braces;

a pair of elongate riser braces each connected at one end thereof to the other end of one of said spanner braces;

a pair of rear struts each including a yoke-like end section with an upwardly extending ear and a downwardly extending ear, said downwardly extending ear of each rear strut being connected to the other end of one of said riser braces;

a pair of elongate non-parallel seat rails, each connected at one end to one of said rear strut upwardly extending ears and extending toward said steering head;

a first elongate cross brace connecting said spanner braces together, and a second elongate cross brace connecting said rear struts together;

a backbone including an elongate upright section having one end connected to said first cross brace and an inclined top section connected at one end thereof to the other end of said upright section, the other end of said backbone top section being connected to said steering head, said seat rails having the other ends thereof connected to said backbone top section;

said seat rails being coplanar with said backbone top section and said second cross brace, thereby defining a seat section, said seat section being rearwardly and downwardly tilted, said backbone top section inclining downwardly from said steering head so that said seat section is below the plane of said steering head;

a shock absorber connected at one end thereof to one wheel of the motorcycle and connected at the other end thereof to one of said rear struts at a location spaced apart from said seat section and above said yoke-like end section upwardly extending ear; and

mounts for mounting a motor and the parts thereof on the frame.

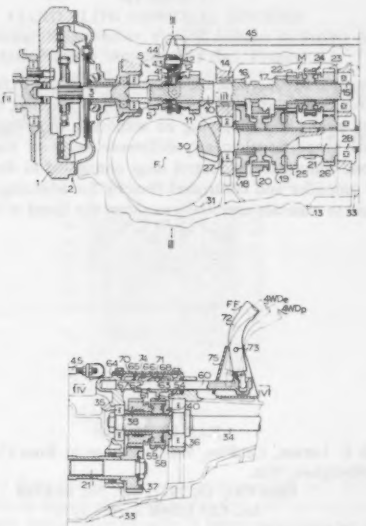
4,170,273

TRANSMISSION APPARATUS FOR FOUR-WHEEL DRIVE MOTOR VEHICLE

Masayuki Kodama, Tokyo; Toshio Takano, Hino, and Sadao Makishima, Akikawa, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1978, Ser. No. 918,337
Int. Cl.[2] B60K *17/34, 41/22*
U.S. Cl. 180—233 **4 Claims**

1. A transmission apparatus for four-wheel drive motor vehicle comprising a first main drive shaft connected to the crankshaft of the engine through a clutch means, a sub-transmission provided adjacent to said first main drive shaft, a second main drive shaft provided adjacent said sub-transmission, said sub-transmission including reduction gear trains and a clutch means manually operable to select the transmitting speeds for transmitting the output of said first main drive shaft to said second main drive shaft, a third main drive shaft provided in parallel with said second main drive shaft, a main transmission provided on said second and third main drive shafts, means for transmitting the output of said third main drive shaft to the front axle and to the rear axle, clutch device provided in said means for transmitting the output of said third main drive shaft for selectively connecting or disconnecting the transmission of the output to either of the front or rear axle,



a shift rod axially slidably provided for shifting said clutch means in said sub-transmission, an actuating rod slidably provided in parallel with said shift rod, a shift lever connected to said actuating rod, a shift fork slidably mounted in said actuating rod and engaged with said clutch device, first engaging means provided for causing said actuating rod and shift fork to come into fixed engagement relationship to each other within a first moving range of said shift lever, thereby to shift the shift fork by manipulating said shift lever, second engaging means provided for causing said actuating rod and shift rod to come into fixed engagement relation to each other within a second moving range of said shift lever adjacent said first moving range thereby to shift said shift rod, and means for positioning said shift rod and actuating rod at the respective stroke ends.

4,170,274

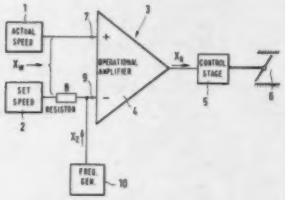
DEVICE FOR REGULATING THE TRAVELING SPEED OF A MOTOR VEHICLE

Harald Collonia, Königstein, Fed. Rep. of Germany, assignor to VDO, Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 16, 1977, Ser. No. 834,065
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1976, 2642753; Oct. 23, 1976, 2648031
Int. Cl.[2] B60K *27/00*
U.S. Cl. 180—179 **8 Claims**

1. In a device for regulating the speed of a motor vehicle propelled by an internal combustion engine having valve

means operable to regulate the air-fuel mixture supplied to the engine, first means generating a first signal by and in response to the instantaneous speed of the vehicle and proportional thereto, second means generating a second signal proportional to the preselected desired speed of the vehicle, third means generating a periodic frequency signal having at least one periodically recurring section of nonlinear characteristic and



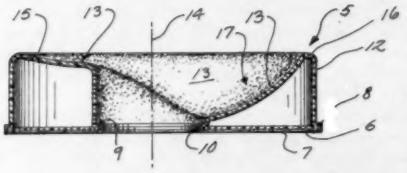
connected to superpose the same on at least one of the first and second signals, an amplifier connected to said first, second and third means and supplying an amplitude modulated control signal proportional to any difference between the first and second signals, and a control stage connected to the output of said amplifier and controlled thereby for adjusting the valve means to maintain essentially constant the speed of the engine.

4,170,275

EAR CUSHION

Paul F. Larsen, Grafton, Wis., assignor to Koss Corporation, Milwaukee, Wis.

Filed Oct. 19, 1977, Ser. No. 843,745
Int. Cl.[2] H04R *25/00, 1/10*
U.S. Cl. 181—129 **11 Claims**



1. An ear cushion for a headphone or the like which comprises:

a back wall having a central opening through which a sond emitting axis extends;

an inner wall which connects to the back wall, which extends around the central opening and which extends in the direction of the sound emitting axis;

an outer wall which connects to the back wall, which extends around the inner wall and is spaced outward therefrom to define the periphery of the ear cushion, and which extends in the direction of the sound emitting axis; and

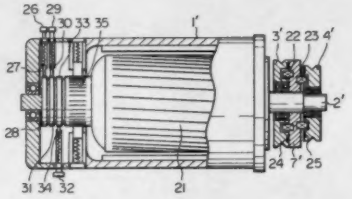
a sealing wall which connects the inner and outer walls and which presents a sealing surface which slopes inwardly with respect to the sound emitting axis toward the central opening with a pitch that varies around the periphery of the ear cushion between a minimum along a front portion of the sealing surface and a maximum over a substantial portion of the sealing surface to the rear of the sound emitting axis.

4,170,276

MOTOR WITH SELECTABLE SPEED CLUTCH

Yoshihiro Hashimoto; Shigeaki Oyama, both of Hachioji, and Hiroshi Araki, Fussa, all of Japan, assignors to Fujitsu Fanuc Limited, Japan

Filed Jan. 24, 1977, Ser. No. 762,131
Claims priority, application Japan, Jan. 23, 1976, 51-5825
Int. Cl.[2] F16D *27/12*
U.S. Cl. 192—48.91 **4 Claims**



1. A motor having a clutch device, comprising:

a motor having a driving shaft;

an armature having both a first contact surface and a second contact surface, said armature being fixedly supported by said driving shaft of said motor and being rotated by said driving shaft, but being slidable with respect to said driving shaft along the axis thereof;

a first rotating drive member having a contact surface corresponding to said first contact surface of said armature, said first rotating drive member being rotatably supported by said driving shaft and facing toward said first contact surface of said armature;

a second rotating drive member having a contact surface corresponding to said second contact surface of said armature, said second rotating drive member being rotatably supported by said driving shaft and facing toward said second contact surface of said armature;

a first electromagnetic exciting member which attracts said armature toward said first rotating drive member when said first electromagnetic exciting member is energized and, thereby, said first contact surface of said armature is directly connected to the contact surface of said first rotating member;

a second electromagnetic exciting member which attracts said armature toward said second rotating drive member when said second electromagnetic exciting member is energized and, thereby, said second contact surface of said armature is directly connected to the contact surface of said second rotating member;

an energizing member which energizes said first electromagnetic exciting member and said second electromagnetic exciting member, alternately, wherein said energizing member is comprised of a first brush and a first slip ring which is rigidly supported by said driving shaft and is electrically connected to said first electromagnetic exciting member via the driving shaft, the first brush being slipped on the first slip ring for supplying electric power;

a first power transmitting member which transmits the rotation of said armature to said first drive member when said first electromagnetic exciting member is energized; and

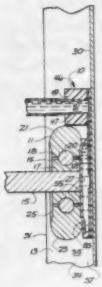
a second power transmitting member which transmits the rotation of said armature to said second drive member when said first electromagnetic exciting member is energized.

4,170,277

LUBRICATING FITTING FOR A CONVEYOR TRACK WHEEL

Steven G. Lindquist, 3140 Clemens Rd., Clarkston, Wash. 99403

Filed Dec. 27, 1977, Ser. No. 864,239
Int. Cl.[2] F16N *3/10*
U.S. Cl. 184—105 C 8 Claims



1. Lubricating fitting for applying lubrication to a bearing of a conveyor track wheel that rides in a partially enclosed track channel in which the partially enclosed track channel forms a confined space of limited access between the track channel and a hub of the wheel, said lubricating fitting comprising:

a body having a shape sufficient to slide along the track channel and fit into the confined space between the track channel and the wheel hub;

said body having an inflatable cavity with a resilient wall that is expandable outwardly under fluid pressure;

said body having means for receiving fluid lubrication under pressure from a lubrication source and communicating the fluid to the inflatable cavity to cause the resilient wall to expand outwardly and bear against and form an annular lubrication seal between the resilient wall and the wheel; and

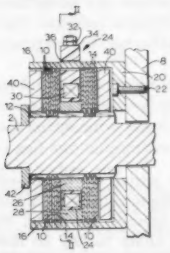
said resilient wall having a dispensing orifice means formed therein for enabling the fluid lubrication to effuse from the inflatable chamber through the dispensing orifice means and into the bearing.

4,170,278

ELECTROMAGNETIC BRAKE

Karl P. Schubert, 6700 Larchmont Dr., Cleveland, Ohio 44124

Filed Apr. 18, 1978, Ser. No. 897,320
Int. Cl.[2] F16D *65/21*
U.S. Cl. 188—161 8 Claims



1. In an electromagnetic brake comprising an annular electromagnet assembly, two relatively axially movable disc shaped ferromagnetic armature members flanking the electromagnet assembly on either side, and at least one rotatable brake disc engageable and disengageable with a non-rotatable annular friction surface upon relative axial movement of said armature members, the improvement in which:

the electromagnet assembly comprises an annular coil unit comprising an annular coil potted in a non-magnetic material to form a rigid and separate assembly, and separate inner and outer annuli of ferromagnetic material respectively, within and substantially surrounding and supported on said coil unit,

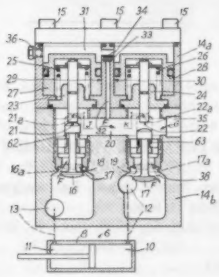
and locating means extend in the same direction as the axis of the assembly between said coil unit, said armature members and any additional member carrying said friction surface to restrain them against relative rotational movement without restraining relative axial movement.

4,170,279

FLUID FLOW CONTROL DEVICES

Claude Pelletier, Saint Vallier, France, assignor to Societe Anonyme Potain Pioclain Materiel (P.P.M.), France

Filed Apr. 13, 1977, Ser. No. 787,220
Claims priority, application France, Apr. 30, 1976, 76 13021
Int. Cl.[2] B60G *25/00;* F16F *9/32;* G05D *11/00*
U.S. Cl. 188—300 4 Claims



1. A fluid flow control device comprising first and second movable valves arranged in respective first and second pipes, each movable valve being capable of being arranged in a first extreme position of complete closure, a second extreme position of complete opening, and a position intermediate between these two extreme positions, with which corresponds an opening less than the said complete opening, resilient return means biasing each valve into said first extreme position, a common chamber, means connecting said first and second valves to said chamber, means for supplying said chamber with fluid under pressure, a pair of pilot jacks, means connecting each pilot jack to said chamber via a flow restriction orifice, a movable stop adjacent each said valve, each stop being coupled to one of said pilot jacks and to a resilient return-member and being capable of being arranged in a first position in which the pilot jacks are not supplied with pilot fluid from said chamber and the stop is out of reach of its respective valve, and a second position in which the pilot jacks are supplied with pilot fluid from said chamber and the stop is positioned to keep its respective valve open at least in its intermediate position.

4,170,280

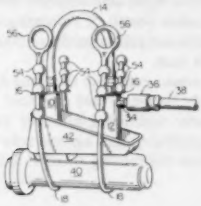
BLEEDER HARNESS FOR BRAKE MASTER CYLINDERS

Maurice L. Schwarz, Middletown, Conn., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Mar. 14, 1978, Ser. No. 886,403
Int. Cl.[2] B60T *11/30;* F15B *7/10*
U.S. Cl. 188—352 11 Claims

1. A harness for connection to a master cylinder to bleed air from an hydraulic brake system coupling the master cylinder to at least one wheel cylinder, the master cylinder having a brake fluid reservoir and an inlet opening to the reservoir and the wheel cylinder having a vent for air, the said harness comprising a body member adapted for thrust connection to the

master cylinder at said inlet and having brake fluid passages connectible with a source of such fluid under pressure for introduction to the system at the said master cylinder inlet, a



crossbar connected to the said body, and a strap adapted for adjustable connection to the ends of the crossbar and to pass around the master cylinder to maintain the thrust connection of the body to the master cylinder at the said inlet.

4,170,281

EXTRUDABLE FLEXIBLE MODULAR TOOTH DRIVEN CONVEYOR BELT

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Jun. 30, 1977, Ser. No. 811,965

Int. Cl.[2] B65G *15/30*

U.S. Cl. 198—844 **3 Claims**

1. For use with a pair of drive sprockets having driving notches transversely of their rotary axis and extending across their load bearing face:

(a) a modular conveyor belt comprising flexible link modules having link anchoring connectors running across the width of the link modules, said link anchoring connectors being formed with two right angle end legs having a spaced foot directed toward each other, one leg having an open ended square recess to mate adjacent links,

(b) an extruded substantially rigid jointing and drive member having openings running the length of the extrusion and being complemental to the link anchoring connectors of a pair of link modules to restrain the links in abutting engagement with said jointing and drive member, said substantially rigid jointing and drive members are extruded with a central top opening to a width equal to two right angle link legs placed back to back and an undercut opening equal to the link module feet directed away from each other, and

(c) the bottom and sides of said jointing and drive member being geometrically complemental to the transverse driving notches of the drive sprockets to be driven thereby.

4,170,282

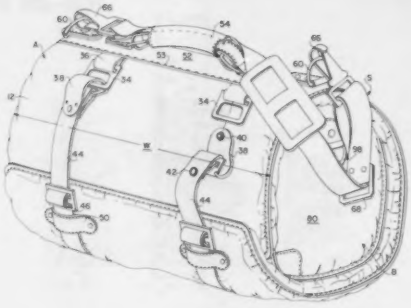
LUGGAGE

Marvin Schwartzstein, Rydal, Pa., assignor to York Luggage Corporation, Lambertville, N.J.

Filed Sep. 14, 1978, Ser. No. 942,192

Int. Cl.[2] A45C *7/00, 13/00*

U.S. Cl. 190—43 **34 Claims**



1. A garment bag and tote bag assembly, the garment bag comprising a pair of panels of flexible material connected to one another at their edges, the garment bag having a longitudinally extending opening provided with a closure, the tote bag having a length substantially equal to the width of the garment bag, the garment bag having a length not less than the circumference of the tote bag, longitudinally spaced cooperable connector means secured to one of the panels for separable connection to each other, and means provided by one of the bags to enable carrying the garment bag-tote bag assembly.

4,170,283

ARTICLE ORIENTING DEVICE

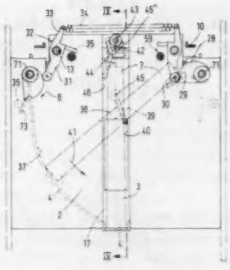
Gustav Idler, Weinstadt, Fed. Rep. of Germany, assignor to Firma C. Eugen Maier Metallverarbeitung GmbH, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 840,963

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645399

Int. Cl.[2] B65G *47/24*

U.S. Cl. 193—45 **29 Claims**



1. A device for setting up in non-reversed position rod-shaped bodies having unequally thick ends, more particularly, conical tubes for spinning, twisting, and similar machines, comprising a feed chute having an inner end, a feed duct, characterized in that at the inner end of the of the feed chute (1), two supporting members (9), for the two ends (4, 7) of the body are disposed which members are movable against a holding force and that above each of the supporting members a pressing finger (10) is provided at a distance exceeding the thickness of the thicker body end (4), both pressing fingers being movable into engagement simultaneously, and the sup-

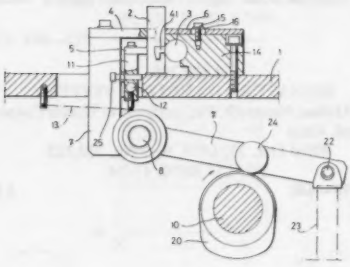
porting member supporting the thicker end being movable by the tube end resting thereon as soon as the pressing finger is applied to the thicker end.

4,170,284

LINEAR TRANSFER DEVICE FOR DISPLACING BODIES ON AN ASSEMBLY MACHINE

Maurice Lachaussee, Ans, Belgium, assignor to Etablissements Lachaussee, Societe Anonyme, Belgium

Filed Dec. 22, 1977, Ser. No. 863,593
Claims priority, application Belgium, Dec. 28, 1976, 0173694
Int. Cl.[2] B65G *23/12*
U.S. Cl. 198—345 2 Claims



1. A device to transfer bodies along a path between the work positions on an assembly machine having a table and feed means for delivering bodies in a row, the device comprising:

a matrix bar extending above and parallel to the table of the machine on one side of the path of the bodies, said bar being carried by a lever mounted on a pivot and said bar having in at least one longitudinal edge and at regular intervals cut-outs whose profile is adapted to the periphery of the bodies;

a rake constituted by a shaft extending parallel to the matrix bar on the other side of the path of the bodies and carrying a plurality of teeth spaced along said shaft with the same spacing as the cut-outs in the matrix bar, said shaft being mounted in bearings fixed on the machine for lengthwise translatory movement through advance and return strokes and for rotational movement about its longitudinal axis;

a straight edge overlying said shaft, said straight edge being positioned in the same plane as the matrix bar and extending parallel thereto, said straight edge thereby serving as a backing means for the bodies accommodated in the cut-outs in the matrix bar;

a guide bar positioned under the matrix bar and extending parallel to said shaft such that it continuously presses the bodies accommodated in said cup-outs against the shaft of said rake;

a driving mechanism for the matrix bar to actuate said lever carrying the matrix bar in order periodically to move the matrix bar into such an operative position that the cut-outs engage the bodies and into inoperative position when the cut-outs are clear of bodies; and

a rake control mechanism coupled to the shaft of said rake, said mechanism comprising means for rotating said shaft so as to move the teeth into disengaged position from the bodies and into engaged position between the bodies while the matrix bar is driven into operative position, and

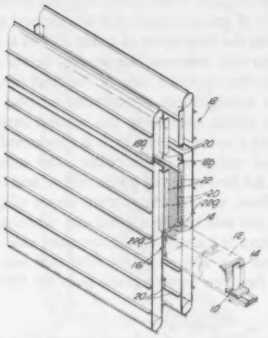
means for imparting to said shaft lengthwise translatory movement through said advance stroke when the matrix bar is driven into inoperative position and through said return stroke when the matrix bar is driven into operative position.

4,170,285

APPARATUS FOR HANDLING ROD-LIKE ARTICLES

Dennis Hinchcliffe, London, England, assignor to Molins, Ltd., England

Filed Aug. 9, 1976, Ser. No. 712,804
Claims priority, application United Kingdom, Aug. 14, 1975, 33839/75
Int. Cl.[2] B65G *1/00*
U.S. Cl. 198—347 4 Claims



1. Apparatus for handling rod-like articles comprising an endless first conveyor; spaced divider means movable with said first conveyor and arranged to separate into batches a stream of rod-like articles on said conveyor, each batch comprising a stack of parallel articles arranged with their axes transverse to their direction of movement on said conveyor, the ends of each batch being confined by said divider means; second conveyor means comprising a pair of opposed cooperating endless band conveyors arranged on opposite sides of said first conveyor, each of said cooperating endless band conveyors having spaced inwardly-directed support means for engaging the ends of articles in a batch on said first conveyor and for removing successive batches directly transversely from said first conveyor, said batches being supported between said cooperating endless band conveyors in spaced relationship by said support means; and stationary guide means disposed along respective lateral ends of each of said cooperating endless band conveyors for retaining the ends of said batches on said second conveyor means, each of said stationary guide means including an inwardly-directed projecting portion with the inwardly-directed projecting portion at the respective ends of the endless band conveyors and having a width which is narrower than the width of said divider means.

4,170,286

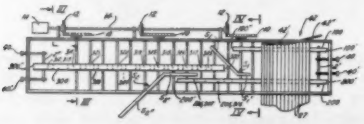
APPARATUS FOR DEFIBERING SHEATHS OF FIBROUS MATERIAL, PARTICULARLY SHEATHS OF ABACA

Juan T. Villanueva, and Jesus T. Villanueva, both of 105 Apo St., Quezon City, Philippines

Division of Ser. No. 543,620, Jan. 23, 1975, which is a continuation-in-part of Ser. No. 258,875, Jun. 1, 1972, Pat. No. 3,887,063, which is a continuation-in-part of Ser. No. 830,449, Jan. 4, 1969, Pat. No. 3,670,366. This application Aug. 18, 1975, Ser. No. 605,327
Claims priority, application Philippines, Jun. 4, 1968, 9282
Int. Cl.[2] B65G *35/00*
U.S. Cl. 198—628 10 Claims

1. A conveyor arrangement, comprising, in combination, a first series of at least three parallel elongated guide rollers having respective first rotation axes, neighboring ones of the guide rollers being spaced apart to define first elongated inter-roller spaces which extend parallel to the first rotation axes; a second series of at least three parallel elongated guide rollers having respective second rotation axes, neighboring ones of the guide rollers of the second series being spaced apart to

define second elongated inter-roller spaces which extend parallel to the second rotation axes, the guide rollers of the first series projecting towards and extending into respective ones of the second elongated inter-roller spaces, the guide rollers of the second series projecting towards and extending into respective ones of the first elongated inter-roller spaces; a first endless conveyor arrangement comprising first elongated endless conveyor means encircling the first series of guide rollers and having a first run which is supported on the surfaces of the first series of guide rollers, the first run extending between the first series of guide rollers and the second series of guide rollers, so that the first series of guide rollers is located to one side of the first run whereas the second series of guide rollers is located to the opposite side of the first run; a second endless conveyor arrangement comprising second elongated endless conveyor means encircling the second series of guide rollers and having a second run which is supported on the surfaces of the second series of guide rollers, the second run extending between the first series of guide rollers and the second series of guide rollers, so that the second series of guide rollers is located to one side of the second run whereas the first series of guide rollers is located to the opposite side of the second run, the second run adjoining the first run and defining together with the first run an elongated path for fibrous material to be



transported and gripped between said first and second runs, said first elongated endless conveyor means being comprised of a plurality of parallel endless first elongated conveyor sections arranged side-by-side in the direction transverse to the elongation of said first sections to define a plurality of elongated parallel first intermediate spaces extending along substantially the entire length of said first run, and said second elongated endless conveyor means being comprised of a plurality of parallel endless second elongated conveyor sections arranged side-by-side in the direction transverse to the elongation of said second sections to define a plurality of elongated parallel second intermediate spaces extending along substantially the entire length of said second run, and wherein along substantially the entire lengths of said first and second runs said sections of said conveyor means project in the direction from the respective one of said runs towards the other one of said runs into respective ones of the plurality of elongated parallel intermediate spaces of the other one of said conveyor means, wherein said first elongated endless conveyor means is comprised of a respective first plurality of parallel spaced discrete endless conveyor members each constituting one of said first sections, and wherein said second elongated endless conveyor means is comprised of a respective second plurality of parallel spaced discrete elongated endless conveyor members each constituting one of said second sections.

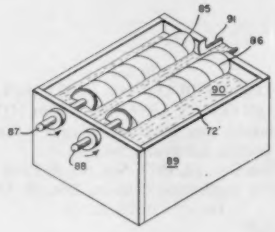
4,170,287

MAGNETIC AUGER

Donald W. Edwards, Wilmington; Richard D. Kinard, Newark; Theodore J. Wirbisky, Wilmington, all of Del., and Richard J. Angelucci, Glenolden, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 18, 1977, Ser. No. 788,671
Int. Cl.[2] B65G *33/00*
U.S. Cl. 198—657 **19 Claims**

1. A device for transporting ferromagnetic particles comprising a sump of ferromagnetic particles, at least one horizontally disposed magnetic auger immersed in said sump which magnetic auger comprises a smooth surfaced rotatable cylinder having at least one line of permanent magnetic material forming a magnetic helix on the surface of said rotatable cylinder with ferromagnetic particles magnetically adhered to said



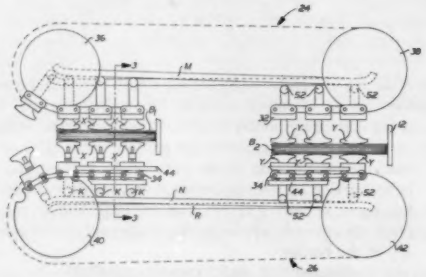
magnetic helix to form flights which act like a mechanical auger.

4,170,288

SIGNATURE HANDLING SYSTEM

Henry R. Mebus, Nazareth, Pa., assignor to Harris Corporation, Cleveland, Ohio

Filed Oct. 13, 1976, Ser. No. 732,115
Int. Cl.[2] B65G *47/64*
U.S. Cl. 198—440 **3 Claims**



1. Apparatus comprising a main conveyor including means for conveying a series of signatures in single stream, a first conveyor including means for conveying a series of signatures in a single stream, a second conveyor including means for conveying a series of signatures in a single stream, conveyor means movable in timed relationship to said main conveyor and to said first and second conveyors, first guide means supported by said conveyor means for movement therewith and for movement relative thereto, said first guide means defining means for engaging moving signatures, first cam means engageable with said first guide means over a predetermined portion of the path of travel of said conveyor means for positioning said first guide means relative to said main conveyor and to said first and second conveyors to establish a first guide path for signatures engaged by said first guide means, said first cam means being positionable in a first position for establishing said first guide path between said main conveyor and said first conveyor and being positionable in a second position for establishing said first guide path between said main conveyor and said second conveyor, second guide means supported by said conveyor means for movement therewith and for movement relative thereto, said second guide means defining means for engaging moving signatures, second cam means engageable with said second guide means over a predetermined portion of the path of travel of said second conveyor means for positioning said guide means relative to said main conveyor and to said first and second conveyors to establish a second guide path for signatures engaged by said second guide means, said second cam means being positionable in a first position for establishing said second guide path between said main conveyor and said

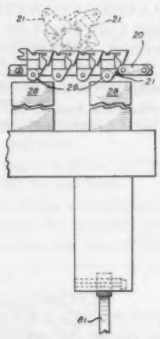
first conveyor and positionable in a second position for establishing said second guide path between said main conveyor and said second conveyor.

4,170,289

PAINT ROLLER CAGE ASSEMBLY APPARATUS

Walter McDonald, Landing, and Norbert J. Seitel, Gillette, both of N.J., assignors to Charles E. Green & Sons, Inc., Newark, N.J.

Filed Feb. 2, 1978, Ser. No. 874,524
Int. Cl.[2] B65G *47/86*
U.S. Cl. 198—479 **8 Claims**



1. A cage assembly apparatus having a cage wire positioning means comprising

a. a pair of conveyors operably mounted in parallelism with each other,

b. mounting means for link members on each of the conveyors,

c. groups of pivotably associated link members,

d. a group of link members attached to each of the mounting means by one of the link members,

e. the link members of each group normally disposed in line with each other, and pivotable to dispose the first and last link member of each group into engagement with each other,

f. a cage wire seat on each link member.

6. A cage assembly apparatus comprising:

a. a a pair of conveyors operably mounted in parallelism with each other,

b. a pair of groups of pivotably associated links mounted on the conveyors,

c. means to intermittently drive the conveyors,

d. the links in each group normally disposed in line with each other,

e. the links in each group pivotable to dispose the the end links in each group in engagement with each other,

f. a cage wire seat on each link of each pair, and defining means to hold a plurality of cage wires on each group of links in general parallelism with each other,

g. cage wire latches pivotably mounted on each of the links,

h. means to pivot the cage wire latches to hold cage wires on the seats when the normally linearly disposed links pivot to dispose the end links into engagement with each other,

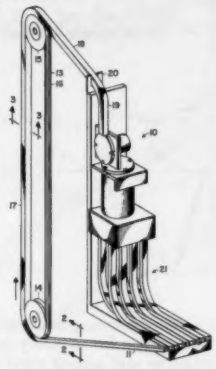
i. means to pivot the links to dispose the end links of each group of links into engagement with each other, whereby cage wires on the seats are positioned to receive end caps.

4,170,290

LIFT AND FEED MECHANISM FOR HIGH SPEED INTEGRATED CIRCUIT HANDLER

Milo W. Frisbie, and Mavin C. Swapp, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1977, Ser. No. 772,695
Int. Cl.[2] B65G *43/00*
U.S. Cl. 198—524 **4 Claims**



1. An apparatus for lifting packaged integrated circuit parts and feeding them into a high-speed handler and tester, said parts having a body portion with lead portions extending therefrom, said apparatus comprising:

a gravity feed input track into which said parts can be loaded,

a continuous vertically disposed fiber-faced belt, said input track and said fiber-faced belt positioned to allow parts placed on said input track to move down said input track to said fiber-faced belt where said lead portion can penetrate and be held by the fibers of said fiber-faced belt,

an O-ring overlying said fiber-faced belt to control the depth to which said lead portions penetrate said fibers of said fiber-faced belt,

means for moving said fiber-faced belt and thereby said parts held by said fibers,

gravity feed reservoir for a high speed handler into which said parts can be dropped, and

output sort tracks.

4,170,291

ARTICULATE CONVEYOR SYSTEM FOR TOWER CRANE

Robert F. Oury, Hampshire, Ill., assignor to Rotec Industries, Elmhurst, Ill.

Filed Mar. 7, 1978, Ser. No. 884,188
Int. Cl.[2] B65G *15/26*
U.S. Cl. 198—588 **5 Claims**

1. An apparatus for conveying a flowable semi-fluid mass to a distant point comprising, in combination:

a first elongated and substantially upright support member;

a second elongated and outwardly extending support member having a first end section and a second end section;

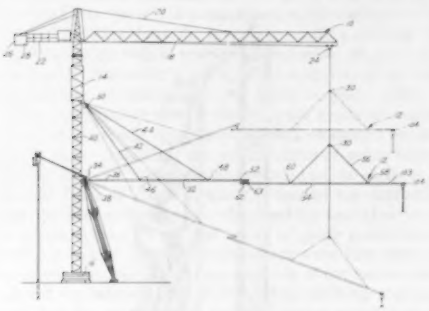
first pivot means for pivotally connecting said first end section of said second support member to said first support member for pivoting about at least a substantially vertical axis;

elongated and articulated discharge conveyor means for conveying said flowable semi-fluid mass to said distant point, said conveyor means having a first conveyor means segment, a second conveyor means segment and a second pivot means for pivotally connecting said first conveyor means segment to said second conveyor means segment for pivoting about at least a substantially vertical axis, said

second conveyor means segment having an end and a discharge point thereon;

third pivot means for pivotally connecting said first conveyor means segment to said first support member for pivoting about at least a substantially vertical axis;

first means for supporting said first conveyor means segment from said first support member;



second means for supporting said second conveyor means segment; and means for movably mounting said second support means to said second support member for linear movement thereof along at least said second end section thereof;

whereby said distant point may be varied by pivoting said second support member and moving said movable mounting means to position said discharge point.

4,170,292

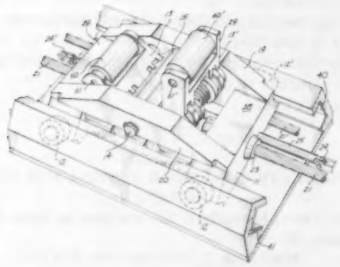
CARGO SHUTTLE

John M. Lang, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1976, Ser. No. 755,835

Int. Cl.[2] B65G *25/10*

U.S. Cl. 198—746 **7 Claims**



1. Apparatus for transporting cargo across a roller equipped, load-bearing surface, said apparatus comprising:

track means extending along the path of travel of said cargo, said track means including a pair of substantially U-shaped tracks opening toward each other and canted downwardly;

a shuttle carriage including a frame and having wheels mounted upon said frame positioned for movement within said tracks;

a rocker yoke;

first and second cargo-engaging pawls;

first means for mounting said first pawl on said rocker yoke for swinging movement of said first pawl into and out of an erect position;

second means for mounting said second pawl on said rocker yoke for swinging movement of said second pawl into and out of an erect position;

third means for mounting sid rocker yoke on said frame for swinging movement of said rocker yoke between a first position in which said first pawl is extended from said frame in a cargo-engaging position and said second pawl is retracted in a nested position substantially within said frame and a second position in which said second pawl is extended from said frame in a cargo-engaging position and said first pawl is retracted in a nested position substantially within said frame;

first biasing means for urging said first pawl toward its erect position;

second biasing means for urging said second pawl towards its erect position;

fourth means associated with said rocker yoke and said pawls and remotely operable to extend and retract said pawls at any location along said tracks; and

draw cable means associated with said shuttle carriage for moving said carriage along said tracks.

4,170,293

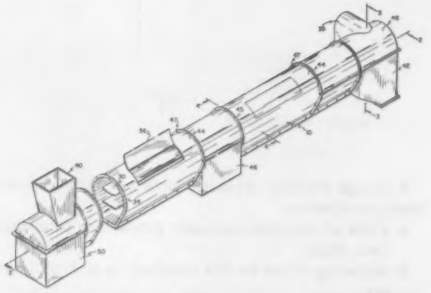
ENCLOSED CONVEYOR

David R. Campbell, Salt Lake City, Utah, assignor to Cambelt International Corporation, Salt Lake City, Utah

Continuation of Ser. No. 641,089, Dec. 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 449,334, Mar. 8, 1974, abandoned. This application Aug. 3, 1977, Ser. No. 821,477

Int. Cl.[2] B65G *21/00*

U.S. Cl. 198—861 **5 Claims**



1. An enclosed conveyor module adapted to be connected with other modules in series, comprising in combination:

a unitary tubular housing having a rounded upper longitudinal side and a planar longitudinal lower side which lower side is removable for purposes of cleaning out spilled materials;

a first pair of longitudinal support members extending respectively along the two lateral edges of said planar longitudinal lower side to reduce deformation of said housing caused by compression;

a second pair of longitudinal support members extending longitudinally along opposite lateral sides of the interior of said housing to reduce deformation of said housing;

roller means attached to said second pair of longitudinal support members for supporting a conveyor belt;

at least one longitudinal support member extending longitudinally along the upper side of said housing to reduce deformation of said housing;

at least one transverse beam mounted within said housing and having mutually opposite ends of said beam attached respectively to the interior of said housing side walls so as to reduce deformation of said housing when under stress; and

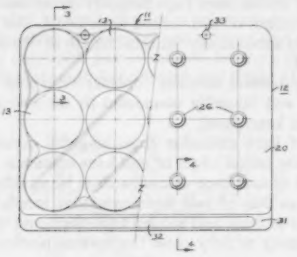
at least one circumferential flange means having opposite ends and encircling said housing so as to reduce deformation of said housing when under stress, said flange means being attached at the respective ends thereof to said first pair of longitudinal support members.

4,170,294

SHIPPING AND DISPLAY TRAY AND PACKAGE

Robert J. Zelinski, 5364 Dakota Dr., Richfield, Ohio 44286

Filed Apr. 10, 1978, Ser. No. 894,555
Int. Cl.[2] B65D *65/16, 85/62*
U.S. Cl. 206—45.33 16 Claims



1. A shipping and display tray for use in connection with a plurality of internal combustion engine oil filters having female threads and annular gaskets comprising, in combination,

a generally flat base,

a plurality of male projections protruding upwardly from and attached to said base,

said projections being of a semi-rigid material deformable in a direction parallel to said base,

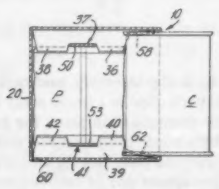
and said projections being engageable by female threads on an oil filter to trap the annular gasket of the oil filter between said flat base and the oil filter.

4,170,295

MULTI-PRODUCT CARTON WITH PRODUCT RETAINING FEATURES

Donald R. Kuehl, Menasha; David C. Mueller, Neenah, and George L. Meyers, Menasha, all of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Jul. 29, 1977, Ser. No. 820,355
Int. Cl.[2] B65D *65/24*
U.S. Cl. 206—45.34 2 Claims



1. In combination, a single-compartment carton folded from a blank and a multi-component product contained therein,

said product comprising a rigid product container having end chimes thereon and a damage-susceptible flexible product container,

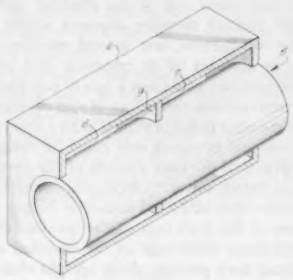
said carton comprising: a plurality of connected foldable panels defining bottom, side, end, and top walls of said carton; crossed minor flaps for confining said rigid product container in a predetermined area and creating a space for containing said flexible product container behind said rigid product container, said flaps being formed from said sidewalls of said carton and adhesively secured to said top and bottom walls and projecting into said carton to contact said rigid product container and to define said predetermined area for confining said rigid product container; and non-adhesive means on said top and bottom walls for engaging said rigid product container chimes to positively secure said rigid product container against movement into or out of said carton.

4,170,296

SELF-HEATING ARTICLES AND PROCESS

Judson D. Wetmore, San Diego, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 3,563, Jan. 7, 1970. This application Nov. 25, 1974, Ser. No. 526,458
Int. Cl.[2] B65D *25/08*
U.S. Cl. 206—219 16 Claims



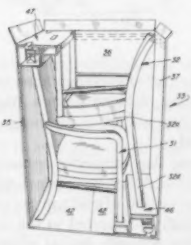
11. A heat recoverable article of manufacture comprising a heat recoverable tube encased within a plastic container having separate compartments therein, one of said separate compartments containing a material capable of undergoing an exothermic chemical reaction and the other of said separate compartments containing a material capable of reaction with said first material to produce heat, and a partition between said compartments capable of being destroyed upon application of tension or a shearing force to provide for mixing of said materials.

4,170,297

SHIPPING UNIT

Charles H. Johnson, Latta, S.C., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Jun. 30, 1978, Ser. No. 920,656
Int. Cl.[2] B65D *81/00, 85/62*
U.S. Cl. 206—326 9 Claims



1. A shipping unit for a pair of chairs arranged in an inverted stacked relation, each chair having a seat portion, an upwardly extending back portion, and supporting front and back legs depending from the seat portion, said unit comprising a container formed from a blank of foldable sheet material and including a plurality of foldably connected upright side panels and at least a plurality of bottom closure flaps connected to corresponding bottom edges of said side panels, said flaps and panels coacting to form a chamber having a closed bottom and upright walls, the height of the chamber walls being at least as great as the height of the pair of stacked inverted chairs; a first inner packing member disposed within said chamber and rest-

ing upon said bottom, said first member engaging the lower interior surfaces of one side panel and a pair of side panels extending angularly from opposite side edges of said one panel, said first member being provided with first means spaced inwardly from said one side panel for snugly accommodating a segment of the back portion of the inverted one of the pair of chairs and second means spaced inwardly from said one side panel a greater distance than said first means for snugly accommodating segments of the front legs of the upright one of the pair of chairs whereby the accommodated front legs of the upright chair and the accommodated segment of the back portion of the inverted chair are retained in relatively spaced relation to each other and to the chamber upright walls; a second inner packing member disposed within the chamber adjacent the top thereof, said second member engaging the upper interior surfaces of an opposing side panel disposed opposite said one side panel and a pair of side panels extending angularly from opposite side edges of said opposing side panel, said second member being provided with a third means spaced inwardly from said opposing side panel for snugly accommodating a segment of the back portion of the upright chair and fourth means spaced inwardly from said opposing side panel a greater distance than said third means for snugly accommodating segments of the front legs of the inverted chair whereby the accommodated front legs of the inverted chair and the accommodated back portion of the upright chair are retained in relatively spaced relation to each other and to the chamber upright walls; and means for closing the top of said chamber and engaging the second inner packing member.

4,170,298

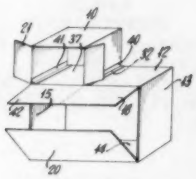
"L" SHAPED CONTOUR CARTON

Gary H. Dorn, Columbus, Ind., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 829,717, Sep. 9, 1977, abandoned. This application Jul. 26, 1978, Ser. No. 928,062

Int. Cl.[2] B65D *85/54*

U.S. Cl. 206—326 **6 Claims**



1. A substantially "L" shaped container having a top portion and a bottom portion, formed from a single sheet of paperboard material, said container comprising:

a first knee panel;

a pair of first knee flaps hingedly connected to the opposite lateral edges of said first knee panel, said pair of first knee flaps closing a portion of said top portion of the container;

a top panel hingedly connected to the top edge of said first knee panel, the opposite lateral edges of said top panel being free;

a back panel hingedly connected to the back edge of said top panel;

a pair of back flaps hingedly connected to the opposite lateral edges of said back panel, said back flaps having a length less than that of said back panel such that a portion of each of the lateral edges of said back panel is free, said back flaps combining with said first knee flaps to fully close the top portion of the container;

a base panel hingedly connected to the bottom edge of said back panel;

a pair of base flaps hingedly connected to the opposite lateral edges of said base panel, said base flaps having a length substantially equal to that of said base panel, said base flaps covering a portion of the bottom portion of the container;

a front panel hingedly connected to the front edge of said base panel, the opposite lateral edges of said front panel being free;

a second knee panel hingedly connected to the top edge of said front panel;

a pair of second knee flaps hingedly connected to the opposite lateral edges of said second knee panel, said second knee flaps having substantially the same length as that of said second knee panel;

a knee extension member coplanar with said second knee panel and hingedly connected to the rear edge of said second knee panel;

a pair of knee extension flaps hingedly connected to the opposite lateral edges of said knee extension member, the length of said knee extension flaps being substantially the same as that of said knee extension member, said knee extension flaps, said second knee flaps, and said base flaps combining to fully close the bottom portion of the container;

means for connecting the bottom edge of said first knee panel to the rear edge of said second knee panel; and

means for connecting the rear edge of said knee extension member to said back panel.

4,170,299

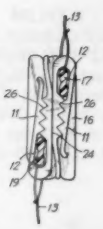
RACK AND TIE-BACK CLIP ASSEMBLY

Alan Clements, Tappan, N.Y., assignor to Ben Clements & Sons, Inc., South Hackensack, N.J.

Filed Jan. 5, 1978, Ser. No. 867,072

Int. Cl.[2] B65D *85/24;* **A44B** *21/00*

U.S. Cl. 206—342 **13 Claims**



1. Rack and tie-back clip assembly, said rack being arranged for holding said tie-back clips in a linear array from which said clips can readily be disengaged in pairs, the two clips in each pair being joined by a cord, comprising an end plate and a bar having two ends, said end plate having an aperture therein for gripping said bar proximate one of said two ends, each of said clips having a slot therethrough for receiving said bar, said bar in cross-section and said slot having mating shapes such as to prevent rotation of said clips around said bar, the two clips comprising each pair being positioned proximate each other on the same bar, said cord, said two clips and that portion of said bar between said pair forming a closed loop which is thereby free of the danger of becoming entangled with the cord on any other pair of clips.

4,170,300

DRESSING CHANGE KITS

Ernest W. Pick, Cos Cob, Conn., assignor to The Purdue Frederick Company, N.Y.

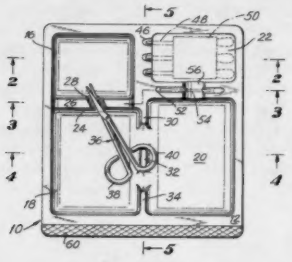
Filed Jan. 18, 1978, Ser. No. 870,590

Int. Cl.[2] B65D *73/36, 79/00*

U.S. Cl. 206—365 **9 Claims**

1. A kit for aseptic change of a dressing such as a catheter dressing, comprising a tray having an upper surface carrying a cover sheet which adheres to said upper surface while being

removable therefrom, said tray being formed with a plurality of depressions which are covered and closed by said cover sheet and which are rendered accessible upon removal of said cover sheet from said tray, a plurality of items in said depressions to be rendered accessible upon removal of said cover sheet from said tray, said items including packettes of cleansing swabs, packettes of antiseptic solution and ointment, swabsticks, gauze pads, adherent tape, as well as further items such as plastic gloves, a plastic bag for receiving a previously applied dressing which is removed, and a drape, and one of said items being a disposable pair of scissors having a pair of loop-shaped handles for receiving a thumb and finger of the operator for cutting items such as one or more gauze pads, adherent tape, or the like, said tray including means defined by said tray including a post which extends through one of said loop-shaped handles of said scissors and a partition separating a pair of depressions from each other, said partition being formed with a notch passing therethrough and receiving a part of said scissors distant from said looped handle portion thereof through which said post extends, for maintaining the latter at a predetermined location in said tray so as substantially to prevent undesired movement of said scissors with respect to said tray during handling and transportation thereof prior to removal of said cover sheet therefrom.



4,170,301

POTTED PLANT SHIPPER

Ancil A. Jones, Mooresville, and Dwight C. Schmidt, Carmel, both of Ind., assignors to Inland Container Corporation, Indianapolis, Ind.

Filed Oct. 19, 1977, Ser. No. 843,731
Int. Cl.[2] B65D *85/52*
U.S. Cl. 206—423 **10 Claims**

1. A package for shipping potted plants which comprises an outer fiberboard container and a plurality of elongated plant holders which are received within said outer container,

each of said holders comprising an integral fiberboard blank which is provided with four parallel, longitudinal lines of weakness of which define a bottom wall, a pair of side walls, and two partial cover panels hinged respectively to the upper edges of said side walls and

which includes locking flap means at both ends thereof for closing the respective ends and thereby securing said holder in tubular form with said partial cover panels overlying the edges of potted plants disposed therewithin but leaving a central opening through which the stems of the potted plants protrude upward,

said outer container comprising top, bottom and a pair of side panels disposed at right angles to one another to form a shipping enclosure and end closure flaps hinged to opposite ends of each of said panels,

said flaps attached to said bottom panel including a main portion equal in length to about the height of said holders and terminating in a first flange which extends for substantially the width of said container and overlies the ends of said plurality of holders,

said flaps attached to said top panels including a main portion having a second flange hinged to the lower end thereof which flange lies in overlying surface contact with said first flange, and also including depending lug means formed from the region of said second flange which lug means extend below the upper edge of said holders and prevent the displacement of said top flap into said enclosure,

said flaps attached to said side panels including means for interlocking with at least one of said top and bottom flaps to complete the end closure,

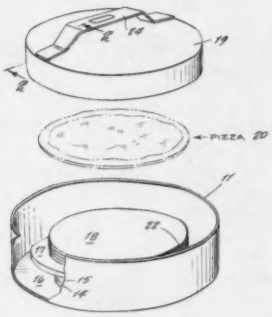
whereby a plurality of said potted plant-carrying holders arranged in abutting side-by-side relationship on said bottom panel are secured against said bottom panel by the presence of said overlying first and second flanges at each end thereof.

4,170,302

THERMAL PIZZA PLATE

Carlos M. Baca, P.O. Box 396, Bernalillo, N. Mex. 87004

Filed Apr. 12, 1978, Ser. No. 895,636
Int. Cl.[2] B65D *11/10*
U.S. Cl. 206—545 **2 Claims**



1. A thermal pizza plate, comprising, in combination, an outside container, a rest mounted inside said container, an insulation disc mounted upon said rest, and an inner closure upon said insulation disc; said rest comprising a lower disc of metal secured upon a bottom wall of said container, and an upper disc made of plastic; said inner closure comprising a plastic filter mounted upon said insulation disc, so that a pizza pie can be placed upon said plastic filter, and a lid placeable over said pizza pie, said plastic filter having an external screw thread around its outer side engagable with an internal screw thread on a side wall of said lid.

4,170,303

COMBINATION TRAY AND PICTURE FRAME APPARATUS

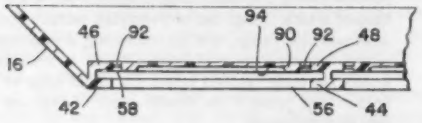
Ronald M. Nolan, 5739 Roanwood Way, Concord, Calif. 94521

Continuation-in-part of Ser. No. 710,782, Aug. 2, 1976, Pat. No. 4,094,085. This application Oct. 25, 1977, Ser. No. 845,321
Int. Cl.[2] B65D *1/34*
U.S. Cl. 206—557 **10 Claims**

1. A combination tray and picture frame apparatus comprising:

a frame portion including a top edge strut, a bottom edge strut, and first and second side edge struts;

strut means comprising at least one strut interconnecting two of said edge struts such that a plurality of window openings are defined in said frame portion thereby, said struts including elongated slot defining means positioned adjacent each said window opening such that a card,



photograph, or the like may be seated therein, to thereby position the card or the like in said opening;

insert means including one or more rigid inserts defined to be of a size such that a beverage container or the like is supportable on each such insert; and

means for affixing each insert to adjacent said struts in a given window opening, such that said window opening is substantially covered by said insert.

4,170,304

WRAPPING FILM

Peter N. Huke, Burnham-on-Sea, England, assignor to British Cellophane Limited, Bridgewater, England

Filed May 19, 1978, Ser. No. 907,508

Claims priority, application United Kingdom, May 26, 1977, 22198/77

Int. Cl.[2] **B65D** *19/00*

U.S. Cl. 206—597 **5 Claims**

1. A method of manufacture of a wrapping film suitable for use in spin wrapping applications comprising extruding a blend of polyethylene with between 0.5 and 10% by weight of a tackifying agent polyisobutylene to form a film and treating one surface of the film with a corona discharge to increase the adhesive characteristics thereof, the level of treatment of the film by corona discharge is not less than the level of treatment required to bring the wetting tension of plain polyethylene film to at least 34 dynes per centimeter.

4,170,305

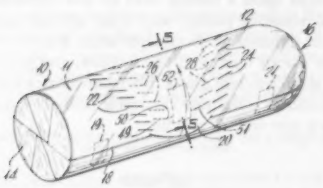
EASY-OPEN WRAPPER FOR CYLINDRICAL PRODUCTS

Raymond J. Hull, Jr., Maplewood, and William F. Hoppes, Somerset, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 11, 1978, Ser. No. 932,966

Int. Cl.[2] **B65D** *3/26*

U.S. Cl. 206—606 **16 Claims**



1. A wrapped cylindrical body having a protective tearable wrapper and comprising:

a cylindrical body;

a generally rectangular wrapper having first and second transverse edges of a width equal to at least the axial length of the body and having first and second longitudinal edges of a length equal to at least twice the radial circumference of the body, said wrapper being rolled about the body;

said wrapper being provided with a first pattern of perforations defining a first perforated zone and consisting of two legs, each beginning at the first transverse edge of said wrapper and extending toward and along each of the longitudinal edges of said wrapper;

said wrapper being provided with a second pattern of perforations defining a second perforated zone and consisting of two legs, each beginning at a longitudinal distance from said first transverse edge of said wrapper equal to at least one radial circumference of said cylindrical body and extending generally parallel to each of the legs of said first pattern, said legs of said second pattern being displaced a distance inward of the legs of the first pattern, with respect to the longitudinal edges of said wrapper;

said wrapper being rolled about said cylindrical body with the first perforated zone overlying the second perforated zone and adhered thereto at the first transverse edge;

whereby, the perforations forming the two patterns are in misalignment and thereby prevent an open path to the cylindrical body and the body may be unwrapped by gripping the first transverse edge, the wrapper tearing along the two perforated patterns.

4,170,306

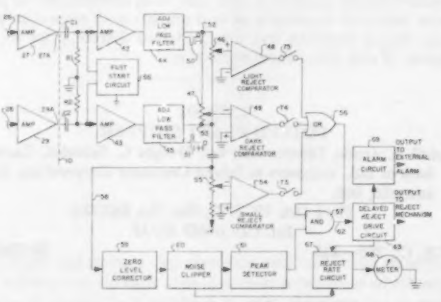
CONTROL APPARATUS FOR SORTING PRODUCTS

William F. Marshall, San Carlos, and Tor Arild, Woodside, both of Calif., assignors to Ultra-Sort Corp., Belmont, Calif.

Continuation-in-part of Ser. No. 695,478, Jun. 14, 1976, which is a continuation-in-part of Ser. No. 687,949, May 19, 1976, abandoned. This application Nov. 29, 1976, Ser. No. 745,935

Int. Cl.[2] **B07C** *5/342*

U.S. Cl. 209—549 **12 Claims**



1. In apparatus for sorting articles in which first and second signals are generated in response to light reflected in two separate wavelength spectra, respectively, from said articles as said articles pass one by one along a first predetermined path and in which third and fourth signals are generated in response to light reflected in two separate wavelength spectra, respectively, from further ones of said articles as said further ones pass one by one along a second predetermined path, said first through fourth signals each including a pulsed portion responsive to said light reflected from said articles and a standing light portion responsive to light reflected from sources other than said articles, the combination comprising

means for substantially removing the standing light portion of said first through fourth signals to provide fifth through eighth signals,

means receiving said fifth and sixth signals for generating a first article reject signal when the ratio of said fifth and sixth signals is more than a predetermined difference from a first predetermined ratio,

means receiving said seventh and eighth signals for generating a second article reject signal when the ratio of said seventh and eighth signals is more than a predetermined difference from a controllable ratio,

means receiving said first article reject signal for averaging said signal with time,

means receiving said second article reject signal for averaging said signal with time,

means receiving said averaged first and second article reject signals for generating an error signal proportional to the difference between said averaged first and second article reject signals, and

means receiving said error signal for altering said controllable ratio, whereby a servo loop is provided tc cause said averaged second article reject signal to follow said first averaged article reject signal.

4,170,307

SERVICE MODULE

Edward C. Maeder, 616 Elm St., Wausau, Wis. 54401

Filed Nov. 4, 1977, Ser. No. 848,490

Int. Cl.[2] F16M *13/00*

U.S. Cl. 211—60 T **7 Claims**

1. A service module, comprising a housing to carry tools, telescopic support means connected to the housing and having an upper retracted position and a lower working position, said telescopic support means including a first tubular member secured to an external support and a second tubular member mounted for sliding movement with respect to said first member, said housing being mounted for rotation with respect to said second tubular member, biasing means for biasing the second member to the retracted position with respect to said first member, the upper end of said second member having provided with at least one longitudinal slot, a generally conical member disposed within the upper end of said second member, a rod threadedly engaged with said conical member and extending downwardly through said second member with the lower end of the rod projecting outwardly of said housing, and an operating member connected to the lower end of the rod and located on the lower surface of said housing, rotation of said operating member in one direction acting to draw the conical member inwardly of said second member to thereby expand the upper end of said second member outwardly into engagement with the inner surface of said first member to thereby lock said members against relative movement.

4,170,308

HYDRAULIC FUNCTION DISCONNECT MEANS

Richard E. Rogers, Waverly, Iowa, assignor to Koehring Company, Milwaukee, Wis.

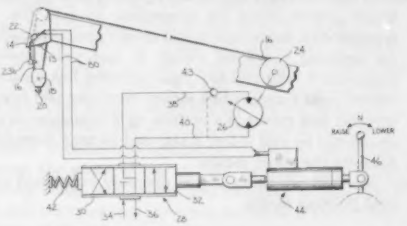
Filed Nov. 1, 1977, Ser. No. 847,670

Int. Cl.[2] B66D *1/56;* **F01L** *31/00*

U.S. Cl. 212—39 DB **18 Claims**

1. In a boom type material handling device having a movable element associated with the boom, fluid motor means for moving the element, valve control means for controlling the motor means, manually-controlled actuator means for actuating the valve control means, linkage means connecting the actuator means to the control means, and sensor means for sensing the position of the movable element with respect to the boom, the improvement comprising:

element movement limiting means forming a part of the linkage means and operatively connected and responsive to the sensor means for being placed in a pair of operative conditions thereby, said limiting means transmitting motion from the actuator means to the control means in a first



condition and permitting movement of the actuator means without resultant movement of the control means in a second or limit condition.

4,170,309

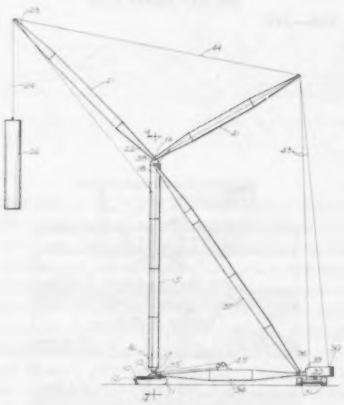
COUNTERBALANCED TOWER CRANE

Neil F. Lampson, Kennewick, Wash., assignor to Riggers Manufacturing Company, Spokane, Wash.

Filed Feb. 14, 1978, Ser. No. 877,816

Int. Cl.[2] B66C *23/72*

U.S. Cl. 212—48 **10 Claims**



1. A counterbalanced tower crane comprising:

earthborn tower base means;

upright tower means having a lower end mounted to said tower base means for horizontal rotational movement about a vertical pivot axis;

boom means pivotally mounted to said tower means at an elevation above said tower base means for pivotal movement relative to said tower means about a horizontal pivot axis, said boom means being extended radially outward to one side of the vertical pivot axis of said tower means;

load hoisting means mounted to said boom means;

an earthborn mobile counterweight unit spaced a substantial distance radially from said tower base means in diametric opposition to said boom means with respect to said vertical pivot axis, said counterweight unit including a counterweight member supported on a mobile base;

power means mounted to said mobile counterweight unit and operably connected to the mobile base thereof for selectively moving the mobile counterweight unit in a circumferential path about said vertical pivot axis;

first rigid spreader link means operably connected to the lower end of said tower means and to said mobile counter-

weight unit for applying rotational torque to the lower end of said tower means about said vertical pivot axis in response to movement of the mobile counterweight unit along said circumferential path;

second rigid spreader link means operably connected to said tower means above its connection to said first rigid spreader link means and to said mobile counterweight unit for applying rotational torque to said tower means in conjunction with said first rigid spreader link means, said second rigid spreader link means overlying said first rigid spreader link means in a vertical rigid triangular structure completed by said tower means and located diametrically opposite the boom means;

and powered winching means operably connected to said load hoisting means.

4,170,310

INSTALLATION FOR MECHANICAL STORAGE, PARTICULARLY FOR THE PARKING OF AUTOMOTIVE VEHICLES

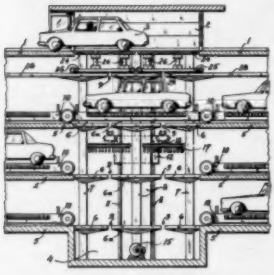
Roger Bajulaz, Chambesy, Switzerland, assignor to Rotopark S.A., Geneva, Switzerland

Filed Dec. 13, 1977, Ser. No. 860,189

Claims priority, application Switzerland, Dec. 24, 1976, 16301/76

Int. Cl.[2] E04H *6/22*

U.S. Cl. 414—241 **13 Claims**



1. A mechanical storage installation comprising a vertical elevator shaft, a plurality of vertically spaced horizontal tracks intersecting said elevator shaft for storage of items to be stored in and retrieved from the installation, and an elevator disposed in the elevator shaft, the elevator comprising a vertical guide structure located outside the horizontal tracks and a mobile device movable along the guide structure, said movable device having at least one comb which is vertically swingable between an active position located inside the tracks and an inactive position outside of the tracks, and means for vertically swinging said comb between said positions between each adjacent vertically spaced pair of tracks, the tracks having openings therethrough for the vertical passage therethrough of said comb.

4,170,311

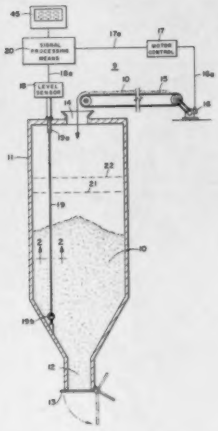
LEVEL MEASURING SYSTEM

Robert L. Spaw, Cypress, Tex., assignor to Automatic Terminal Information Systems, Inc., Houston, Tex.

Filed Jan. 19, 1978, Ser. No. 870,693

Int. Cl.[2] B65G *65/76*

U.S. Cl. 414—289 **7 Claims**



1. A measuring system for measuring a variable level of matter present within a chamber, said system comprising:

a sensing probe operatively mounted within said chamber and being responsive to changes in the quality and/or quantity of matter being measured;

an oscillator,

a reference probe,

a switching network selectively connecting said oscillator with said sensing probe and said reference probe;

the frequency of oscillation of said oscillator varying with changes in the reactance of said sensing probe caused by the changes in the quality and/or quantity of the matter being measured;

electrical signal processing means for processing the sensing signal produced by the oscillator when the sensing probe is connected to the oscillator and for processing the reference signal produced by the oscillator when the reference probe is connected to the oscillator; and

means for comparing said sensing and said reference signals to obtain a measurement of said level of matter.

4,170,312

CONTAINER

Robert Lloyd, Galston, and Maxwell J. Turner, Sylvania, both of Australia, assignors to Energy Recycling Corporation Pty. Ltd., Sylvania, Australia

Filed May 24, 1977, Ser. No. 800,147

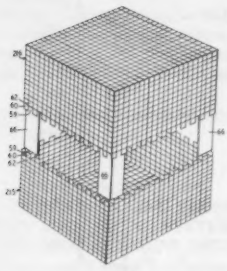
Claims priority, application Australia, May 27, 1976, PC6072

Int. Cl.[2] B65D *7/18, 25/14, 81/02*

U.S. Cl. 224—4 B **9 Claims**

1. A container for particulate matter, comprising a closed case of rectangular or square prismatic shape having two opposite end walls and two pairs of side walls extending between said end walls, said case being formed from two open ended sections each having an end wall and four side walls extending therefrom, said sections being joined at their open ends, each end wall being formed from at least two sets of interwoven metallic strips, the strips of each set extending parallel to one another and transversely to the strips of at least one other set, each set of strips having free unwoven ends extending substantially normally from said woven end and having a further set of metallic ring strips interwoven with said free ends, said further set of metallic ring strips extending

around the four side walls to form said four side walls of each section with said extending strips from said end, said side walls having at least each alternate strip which extends from said end extending beyond the last metallic ring strip of the side wall such that the two open ended sections are brought together at their open ends and each extending strip is joined in an over-

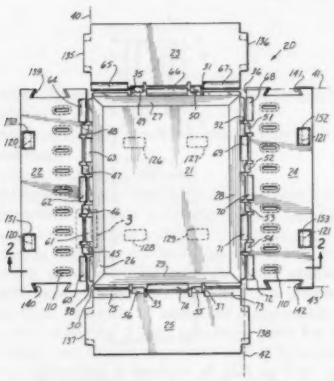


lapping manner to a strip which extends from the end of the other section, such that the alternating weave is continued, to form said casing wherein each strip from the ends of said casing becomes an independent ring, and wherein each adjacent strip of at least one set being spaced laterally from one another by a distance which is small in relation to the width of the strips of said one set.

4,170,313
BOX AND BLANK FOR FORMING THE BOX

Robert B. Caves, 17018 Edwards Rd., Cerritos, Calif. 90701, and Walton B. Crane, 4346 Matilija, Sherman Oaks, Calif. 91403

Filed Dec. 29, 1977, Ser. No. 865,377
Int. Cl.[2] B65D *7/24, 7/42, 9/14*
U.S. Cl. 220—7 **15 Claims**



1. A box blank foldable to form a box having a bottom and four sidewalls, said blank comprising:

a nominally planar bottom member having four edges in rectangular array, said bottom member having a top surface;

four nominally planar sidewall members, each said sidewall member having an edge, each sidewall member being adjacent to a respective one of said edges of the bottom member, the pairs of sidewall member edges and bottom member edges being adjacent to each other, the members of said pairs being laterally spaced apart from one another along a respective fold axis;

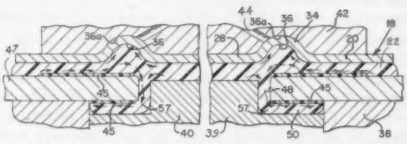
a strap hinge respective to each said pair of edges joining the said members together, said hinges being flexible, whereby to permit rotation of said members relative to one another around said fold axis; and

a stabilizer member comprising a tooth adjacent to one of said edges of each one of said pairs of edges and a recess adjacent to the other one of said edges of each of one of said pairs of edges, each of said sidewall members having either a said tooth or a said recess and each edge of said bottom member having a complementary said recess or said tooth, said tooth and said recess each having a restraint face which, when engaged by the other restrains the bottom member and respective sidewall member from lateral translational separation normal to said fold axis along the plane of one of said member, said tooth and recess being so disposed and arranged as to be interengaged with one another when the blank is folded with the plane of the sidewall member substantially normal to the plane of the bottom member.

4,170,314
CONTAINER CLOSURE

Robert J. Weierman, Lockport; Joseph J. Merle, Oak Lawn; Gerald A. Gordon, Skokie; Peter N. Y. Pan, Country Club Hills, and Rafael J. Hernandez, Chicago, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Oct. 11, 1978, Ser. No. 950,483
Int. Cl.[2] B65D *41/02*
U.S. Cl. 220—260 **19 Claims**



1. The combination of an end member having exterior and interior surfaces and having a pour opening defined by a marginal edge, a closure for said opening comprising a tape having a laminate including a metal top portion and a thermoplastic bottom portion, heat activatable adhesive means between said exterior and said thermoplastic bottom portion of said tape, said bottom portion being releasably adhered through said adhesive means to said exterior by heating said tape and pressing the same against said exterior surface, said tape having formed in situ upon application to the end panel an outwardly distended rib encompassing said opening circumjacent said marginal edge by flowing into a cavity formed in said metal top portion excess thermoplastic material of the bottom portion attendant to pressing of said heated tab against the interior of said end panel to thereby minimize the flow of said thermoplastic material at the interface with the exterior of the end panel and thereby provide an improved bond therewith.

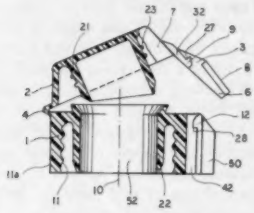
4,170,315
CLOSURE FOR RIGID AND DEFORMABLE CONTAINERS

Werner F. Dubach, Wallisellen, and Hansruedi Kessler, Hallau, both of Switzerland, assignors to Createchnic Patent AG, Wallisellen, Switzerland

Filed Feb. 10, 1978, Ser. No. 876,734
Claims priority, application Switzerland, Feb. 10, 1977, 1611/77; Jul. 22, 1977, 9115/77
Int. Cl.[2] B65D *43/04*
U.S. Cl. 220—281 **30 Claims**

1. A closure by synthetic-resin material for rigid or deformable containers having a base mountable on said container with at least one discharge opening; and a cap with a seal connected

to said base by a hinge joint provided with at least one lever-type projection, said lever type projection being articulated to



said cap and having at least one pressing plate, at least one hook-shaped formation and at least one detent pin on the base.

4,170,316

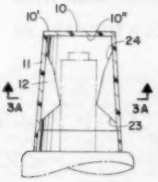
OVER-CAP CLOSURE DEVICE

Mannie LaBarbera, 160 Hunt's La., Chappaqua, N.Y. 10514

Continuation-in-part of Ser. No. 529,642, Dec. 5, 1974, abandoned. This application Sep. 29, 1977, Ser. No. 837,932

Int. Cl.[2] **B65D** *41/16*

U.S. Cl. 220—306 **8 Claims**



1. In an over-cap device having wedge projections extending a major distance radially inwardly and adapted for grasping substantially cylindrical outer walls of a container lid or cap, the improvement comprising in combination: a unitary molded resilient plastic cap means defining a top substantially horizontal inner wall having a periphery and having substantially cylindrical inner side walls downwardly extending from a plurality of points around said periphery, and the cylindrical inner side walls at a plurality of spaced-apart locations having at each of said spaced-apart locations a projection extending radially-inwardly a predetermined distance beneath a lower horizontal face of the top substantially horizontal inner wall, each projection having an upper, upwardly-facing edge spaced-from said lower face; and as mechanism for said grasping by wedge action, at least one of said projection having a radially-inwardly-facing edge; said upwardly-facing edge extending radially inwardly beyond the point of said plurality of points, of attachment the cylindrical inner side wall of the spaced-apart location thereabove.

4,170,317

TOWEL-DISPENSING GOLF BAG INSERT

Stanley F. Fisher, 1228-½ W. 29th, Anderson, Ind. 46014

Filed Mar. 14, 1977, Ser. No. 776,956

Int. Cl.[2] **A63B** *57/00;* **B65D** *85/67*

U.S. Cl. 221—76 **8 Claims**

5. The combination, comprising:

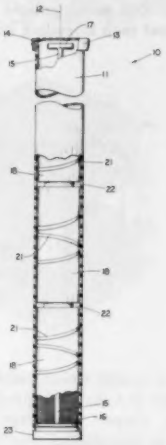
(a) a golf bag;

(b) a tubular container inserted in said golf bag, said container being about the same length as the inside compartment in said golf bag;

(c) a cap removably mounted to one end of said container;

(d) a rod of about the same length as said container and located along the central axis of said container, said rod being reciprocable along the central axis when said cap is removed;

(e) a base mounted to the end of said rod opposite said cap;



(f) and a plurality of towels concentrically wrapped around the shaft of said rod and axially reciprocable therewith.

4,170,318

FIXED VOLUME DISCHARGE DEVICE

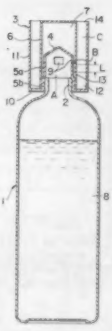
Noriyoshi Saeki, Umezawacho-2-chome, Toyama-shi, Japan, and Kiyoko Nakamura, Toyama, Japan, assignors to Noriyoshi Saeki, Toyama, Japan

Filed Aug. 5, 1977, Ser. No. 822,366

Claims priority, application Japan, Aug. 6, 1976, 51-94148

Int. Cl.[2] **G01F** *11/26*

U.S. Cl. 222—455 **9 Claims**



1. A fixed volume discharge device adapted to be mounted to the opening of a container, comprising:

i. an inner cap having a first peripheral wall the lower end portion of which is fitted onto the neck portion of the container;

ii. an outer cap having top wall and a second peripheral wall which is integrally connected at its lower end to the outer surface of said first peripheral wall, and encasing said inner cap therewithin so as to define an annular gap between said first and second peripheral walls;

iii. a first chamber defined within said outer cap above said inner cap;

iv. a first opening means provided in said inner cap for communicating said first chamber with the interior of the container;

v. a wall member surrounding said outer cap and having an annular flange extending from the lower periphery thereof toward said second peripheral wall of said outer cap, the inner periphery of the annular flange being integrally jointed to the lower outer surface of said second peripheral wall;

vi. a second chamber defined within said wall member outside of said outer cap;

vii. a second opening means provided in said second peripheral wall for communicating said second chamber with the lowermost portion of said first chamber, said second chamber being positioned below said second openings; and

viii. a discharging outlet communicating said second chamber with the atmosphere.

4,170,319

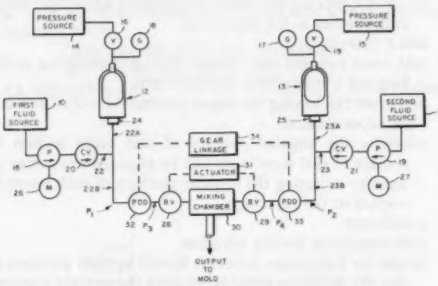
APPARATUS FOR CONTROLLING FLUID FLOW IN A FLUID DELIVERY AND MIXING SYSTEM UTILIZING POSITIVE DISPLACEMENT DEVICES

Nam P. Suh, Sudbury, and Charles L. Tucker, III, Medford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 31, 1977, Ser. No. 801,321

Int. Cl.[2] B67D *5/60*

U.S. Cl. 222—134 **6 Claims**



1. A system for mixing at least two fluid components, said system comprising

at least two sources for providing at least two different fluid components;

at least two accumulator means;

means for independently supplying under pressure to each of said accumulator means a different one of said fluid components from said fluid component sources, said accumulator means each thereby being independently charged to a selected predetermined pressure, said predetermined pressures being selected to provide for a predetermined volume flow rate ratio of said fluid components;

a mixing device having at least two input ports for receiving said at least two fluid components and at least one output port for delivering a mixture of said at least two fluid components therefrom;

supply line means associated with each of said accumulator means for supplying the associated fluid components therefrom to separate ones of said input ports;

means for controlling the supply of said fluid components to said mixing device from said at least two accumulator means, said controlling means including

positive displacement means in each of said supply line means;

means for linking the operations of said positive displacement means for controlling the accuracy of the volume flow rates of said fluid components through said positive displacement means so that the volume flow rates of said fluid components, as supplied to said mixing device, are maintained in a preselected relationship, said predetermined volume flow rates of said fluid components provided for by said predetermined pressures to which each accumulator means are independently charged being so selected as to minimize the pressure drop across each said positive displacement means when the supply of said fluid components is activated, whereby errors in the maintenance of said volume flow rates by said positive displacement means are minimized; and

means for activating the supply of said fluid components from said accumulator means to said mixing device.

4,170,320

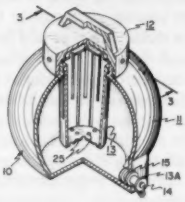
BEVERAGE CONTAINER

Lee J. Eagar, P.O. Box 297, Hurricane, Utah 84737

Filed Nov. 14, 1977, Ser. No. 850,929

Int. Cl.[2] B67D *5/62*

U.S. Cl. 222—146 C **6 Claims**



1. A beverage container including, in combination: an outer housing shell having a fluid-flow release valve; a lid removably secured to said housing shell, said housing shell having an interior shoulder disposed beneath said lid; and an interior, perforate, molded, unitary, solid-cooling-agent container provided with an upper, outwardly radially extending ring-like flange resting upon said interior shoulder, and wherein said interior container has an upper mouth and is elongate and cup-configured, having a central axis, and, further is provided with a plurality of sidewall slots open-ended at said mouth and individually and respectively coplanar with said axis.

4,170,321

BUCKET WHEEL SLUICE HAVING MESH-ENGAGED REMOVAL UNIT

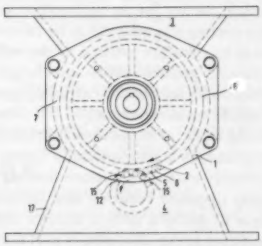
Andreas Jaudt, Schongauerstrasse 10 c, D-8900 Augsburg, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 895,179

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1977, 2733808

Int. Cl.[2] G01F *11/24*

U.S. Cl. 222—220 **12 Claims**



1. A bucket wheel sluice comprising a housing having an inlet and outlet separated from one another by intervening curved walls, a sluice wheel mounted for rotation within said housing between said inlet and said outlet, the periphery of said sluice wheel having a plurality of spaced outwardly projecting vanes which pass along and sealingly engage said curved walls

during rotation of said sluice wheel, adjacent ones of said vanes defining pockets therebetween for the reception of material at said housing inlet and for delivery of such material to said housing outlet as said sluice wheel rotates, the periphery of said sluice wheel as defined by said vanes and the spaces therebetween being of toothed gear configuration, and a removal unit for facilitating the discharge of material from said pockets at said housing outlet comprising a plurality of parallel discs spaced from one another and mounted for rotation adjacent said housing oulet about an axis that is parallel to the axis of rotation of said sluice wheel, each of said discs having a peripheral toothed gear configuration which is complementary to the peripheral toothed gear configuration of said sluice wheel and which is in mesh engagement with said periphery of said sluice wheel, said removal unit including a plurality of elongated elements extending in directions generally parallel to the axes of rotation of said sluice wheel and discs and located respectively between corresponding teeth of said spaced discs, said elongated elements passing successively through the successive pockets of said sluice wheel at said housing outlet during rotation of said mesh-engaged sluice wheel and discs to mechanically remove any entrapped material from said pockets of said sluice wheel for delivery to said housing outlet.

4,170,322

VEHICLE ARTICLE CARRIER

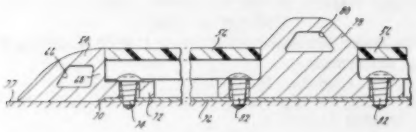
John A. Bott, 931 Lake Shore Dr., Grosse Pointe Shores, Mich. 48236

Division of Ser. No. 604,643, Aug. 14, 1975, Pat. No. 4,055,284 which is a continuation-in-part of Ser. No. 486,415, Jul. 8, 1974, abandoned.

The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.

Int. Cl.[2] **B60R** *9/00*

U.S. Cl. 244—326 **16 Claims**



14. In an article carrier for an automotive vehicle,

an article supporting slat adapted to be mounted in contiguous relation to a surface portion of the vehicle,

said slat being of greater width than height in transverse cross-section with said width extending generally parallel to said vehicle surface portion,

said slat having a pair of longitudinally extending side walls, said side walls forming an upwardly facing surface having a longitudinally extending groove formed therein, a protective strip disposed between said sidewalls and within said groove to define a hollow interior within said slat,

an article securing means disposed in part within said hollow interior and located at least in part below said protective strip, and

fastening means disposed within said hollow interior and extending downwardly through said article securing means and said slat into the vehicle surface for securing said article securing means within said hollow interior and said slat to said vehicle.

4,170,323

AUTOMOBILE TOP LUGGAGE RACK

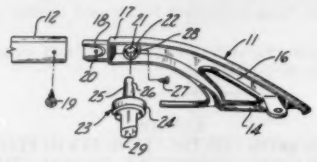
Frederick A. Helm, 9818 Grinnell Ave., Detroit, Mich. 48213

Division of Ser. No. 341,128, Mar. 14, 1973, Pat. No. 3,853,254. This application Oct. 10, 1974, Ser. No. 513,600

The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.

Int. Cl.[2] **B60R** *9/04*

U.S. Cl. 224—309 **4 Claims**



1. In a car top carrier, the combination comprising

a pair of stanchions,

a side rail,

means for fixing the side rail to one of the stanchions,

each said stanchion having a laterally extending opening therein,

an insert having a portion projecting into said opening,

means for locking the insert in angularly adjustable position with respect to the stanchion,

and a cross rail,

said cross rail and said inserts having telescoping portions forming a connection therebetween,

said cross rail having the major portion thereof of non-circular cross section,

whereby the angular position of said cross section with respect to said stanchions can be adjusted to various positions by adjusting the angular position of each insert with respect to the stanchion,

a deflector,

said stanchions having uprights,

means for fixing said deflector to said upright portions such that the deflector extends between the upright portions to effectively deflect air to clear the rear window of the car,

said stanchions thereby forming the sole support for supporting said deflector from the ends of the deflector.

4,170,324

BRACKET MOUNT FOR LOCK BOX

James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Continuation-in-part of Ser. No. 760,955, Jan. 21, 1977, Pat. No. 4,058,993. This application Jun. 16, 1977, Ser. No. 807,231

Int. Cl.[2] **B60R** *11/00*

U.S. Cl. 224—279 **14 Claims**

1. A bracket mounting assembly for mounting an object to a stationary plate, said assembly comprising

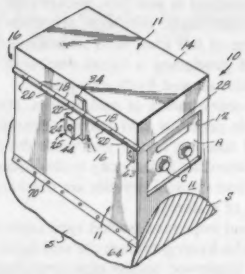
(a) a first discrete generally U-shaped member having the legs thereof spaced a distance sufficient to receive the object therebetween,

(b) a second discrete generally U-shaped member having the legs thereof spaced an effective distance sufficient to receive the legs of the first member therebetween,

(c) first removable fastening means for fastening the object to both said first and second members legs so that said first fastening means is irremovable from the exterior of said object, said fastening means comprising at least one removable fastener extending from the interior of the object through each leg of said first member into an engaging relationship with each leg of said second member, and

(d) second fastening means for fastening said second member to said stationary plate, said second fastening means comprising at least one fastener extending from a location

between the cross-portions of said first and second members through said first U-shaped member and said stationary plate, said fastener being inaccessible from the exterior



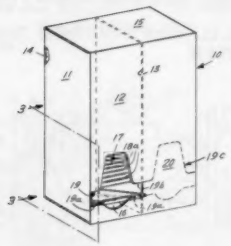
of said first and second members when the legs of said first and second members are fastened together with said first fastening means, the cross-portion of said first member overlying and covering said second fastening means.

4,170,325

RECEPTACLE

Thomas D. Pawlowski, Neenah, and George L. Meyers, Menasha, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Jun. 20, 1978, Ser. No. 917,367
Int. Cl.[2] B65D *5/72*
U.S. Cl. 229—17 B **6 Claims**



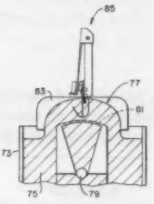
1. A package comprising an elongated receptacle adapted for vertical disposition, and a stack of relatively thin articles contained therewithin comprising at least a lower bottommost article and an overlying article, said receptacle being comprised of sidewall portions defining a vertical passageway through which said articles may descend, a bottom wall portion providing underlying support for said stack of articles, and a dispensing opening proximate said bottom wall portion for dispensing said articles, the distance between two opposite sidewall portions of said receptacle being less than a width dimension of said articles with said articles positioned so that said width dimension extends between said two sidewall portions, so as to slantingly dispose said articles within said passageway with a leading edge of at least said overlying article lying against one of said opposite sidewall portions and with the opposite edge thereof lying therebelow against the other of said opposite sidewall portions, the upper edge of said opening being in said one opposite sidewall portion, said opening being dimensioned and configured to permit one of said articles to pass laterally therethrough, at least a portion of the upper edge of said opening being spaced below the leading edge of said overlying article a distance no more than substantially the thickness of said articles, said one sidewall portion being free of obstructions near said upper edge on the interior of said carton whereby removal of said bottommost article will permit said overlying article to descend, said leading edge thereof passing below said upper marginal portion of said opening and thereby to project therethrough, for facile removal.

4,170,326

METHOD AND HOLDING FIXTURE FOR SOLDERING LEAD FRAMES TO HYBRID SUBSTRATES

Stanley J. Wright, Albuquerque, N. Mex., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 9, 1978, Ser. No. 868,081
Int. Cl.[2] B23K *1/08*
U.S. Cl. 228—37 **16 Claims**



1. In a dip solder machine including means for moving a portion of a work piece into and out of a molten solder bath, apparatus for holding in a generally upright position a hybrid assembly work piece including a substrate which may have electrical components soldered to conductive patterns on one side thereof at positions spaced at least a prescribed distance from conductive lands on the one side and adjacent to one edge of the substrate and an elongated lead frame having a conductive bar and a plurality of parallel leads projecting therefrom in the same direction with fingers on free-ends of leads fitting over the one edge of the substrate and at least some fingers contacting associated lands on the substrate for dip soldering lead frame fingers to associated lands, comprising;

a plate oriented in a generally upright position;

a plurality of hook elements each comprising a relatively straight shank portion connecting one end portion thereof to a curved hook portion having a base and an arm extending from the base in the general direction of the shank portion;

means for attaching the one end portions of said hook elements to said plate with the hook portions opening in the same-one direction and their bases all in the same-one line that is substantially perpendicular to the one directipn; and

means cooperating with said plate for supporting a substrate in a generally upright positon next to said plate with the bar of a lead frame on the substrate contacting hook element bases as said apparatus is moved generally in the direction opposite the one direction to place the hook portions and lead frame in molten solder and removed therefrom for soldering lead fingers to associated lands.

4,170,327

HINGED COVER CARTON

Norman A. Bruml, 201 Donnybrook Rd., Montvale, N.J. 07645

Filed Sep. 20, 1978, Ser. No. 944,512
Int. Cl.[2] B65D *5/66*
U.S. Cl. 229—44 R **13 Claims**

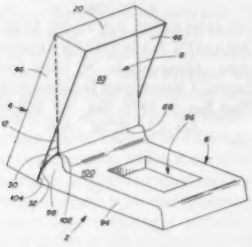
1. A hinged cover carton comprising:

a cover means, said cover means comprising a top panel and a side wall integrally attached thereto, said side wall extending the entire perimeter of said top panel;

a base assembly comprising a base section having a raised, beveled area along a portion thereof, said base section being hingably attached to said side wall of said cover means; and

a guide means attached along a portion thereof to said beveled area, and attached along an opposing portion thereof to the inside of said cover means, wherein said guide

means is adapted to alternately urge said cover means towards a closed and opened position and retain said



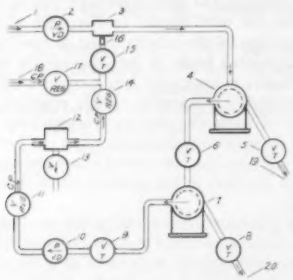
cover means in a plurality of partially opened positions when said cover means is at an appropriate angular position with respect to said base assembly.

4,170,328

DESALINATION BY THE INVERSE FUNCTION OF THE KNOWN (SALTING-OUT) EFFECT WITHIN AN IMPROVED CENTRIFUGE

Samuel A. Kirk, Box 65, Pringle, S. Dak. 57773, and Clair F. Kirk, 856 Pine St., Wheatland, Wyo. 82201

Filed Feb. 2, 1978, Ser. No. 874,708
Int. Cl.[2] B04B *1/00*
U.S. Cl. 233—13 **7 Claims**



1. A continuous process of desalination of sea water which comprises the use of known centrifugal and inertia force as produced by a pocket type centrifuge to separate lights from heavies and it is known that sea water becomes hydrated and consists of entities of electrostricted water molecules that surround the sodium chloride ions, and there is a known "salting-out" effect, with the said process beginning with prescreened sea water which is treated by mechanical means wherein the improvement consists of,

injecting hydrogen gas into sea water and then using the catalytic effects of the hydrogen as well as the three forces within the pockets of a first non-swirl action pocket type centrifuge, that utilizes hydraulic, inertia and centrifugal force for separating fluid mixtures and which produce an inverse function of the said "salting-out" effect within the said centrifuge,

wherein hydrogen produces a differential density by attaching hydrogen molecules to fresh-water molecules and floating away from the heavier said entities, which results in a partial separation within the said pockets,

with a second partial separation within the same said pockets, in which positive charged protons in the hydrogen reject the salt by electrostatic repulsion of the positive sodium ions held within the said entities, with the electrostatic repulsion acting both within the solution and from the confines of the said first pocket type centrifuge, and in which the sum of the salt entities motions, produced by the said electrostatic repulsion, is away from the lights end of the said pockets,

with the said first and the said second partial separations forming a layer of hydrogen trapped between the baffle plates contained in said first pocket type centrifuge, from which, electrostatic repulsion produces a layer of water that is free of salt ions, with streamline flow in each said layer and producing a lights discharge of a mixture of fresh-water, air and hydrogen gas,

while the concentration of said entities, containing salt ions from both previous said partial separations, produces a saturated solution of salt ions with the formation of salt crystals, aided by a similarity to the common ion effect of protons, and the said crystals are discharged as heavies in the form of a slurry,

with a second improved pocket type centrifuge provided to separate the hydrogen from the said lights discharge of the first said improved pocket type centrifuge and the recovered hydrogen gas is recycled, while the heavies discharge is aerated fresh water,

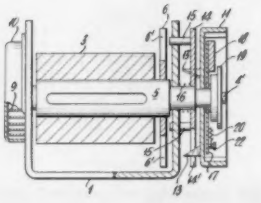
while the said second improved pocket type centrifuge is provided with a heavies exit throttle valve in addition to the lights exit throttle valve and a fine adjustment of both said valves give a time element to the separation that permits the period of treatment in said second centrifuge at the same time as said first centrifuge.

4,170,329

EMERGENCY LOCKING VEHICLE SAFETY BELT RETRACTOR

Juichiro Takada, Tokyo, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1977, Ser. No. 847,374
Claims priority, application Japan, Nov. 18, 1976, 51/153894[U]
Int. Cl.[2] A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.4 B **7 Claims**



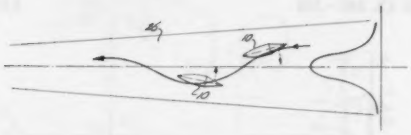
1. An emergency locking safety belt reel device comprising a bracket including side walls, a first of which has a plurality of annularly spaced guide openings therein, a belt take-up reel including a shaft extending between said side walls and projecting beyond said first side wall and rotatable with said reel in opposite belt extraction and retraction directions, spring means biasing said reel to rotate in a belt retraction direction, a first brake member affixed to said shaft proximate the inside face of said first side wall and having a plurality of annularly spaced locking openings formed therein, a second brake member slidably mounted on said shaft and located proximate the outside face of said first side wall and having a plurality of circumferentially spaced radially extending slots with radially extending follower edges and inlcuding a plurality of locking elements projecting therefrom into sliding engagement with respective guide openings in said first side wall and movable between an advanced position in the rotational paths of said locking openings and a retracted position outwardly thereof, spring means biasing said second brake member to its retracted position, and brake actuating means including a wheel rockably mounted on said shaft and means for rocking said wheel and cam fingers projecting from said wheel into engagement with said follower edges.

4,170,330

WEAPONS SYSTEM

Abraham Hertzberg, Bellevue, and David A. Russell, Kirkland, both of Wash., assignors to Mathematical Sciences Northwest, Inc., Bellevue, Wash.

Filed Apr. 12, 1974, Ser. No. 460,425
Int. Cl.[2] F42B *15/00*
U.S. Cl. 244—3.13 14 Claims



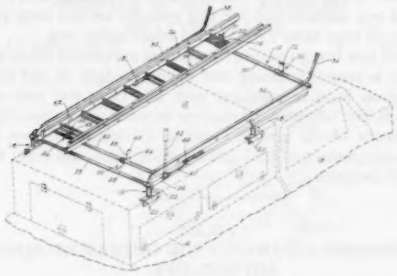
1. A weapons system comprising:
a shell having a high velocity aerodynamic shape including an axially symmetric rear portion;
a coating on said axially symmetric rear portion of said shell composed of a material easily vaporizable by a low power laser beam;
means generating a low power laser beam;
means directing said laser beam onto a target; and
means projecting said shell into said laser beam toward said target whereby said beam controls said shell and guides it to said target by means of forces acting directly on said shell produced by preferential vaporization of said coating.

4,170,331

VEHICLE LADDER RACK

Eugene W. Faulstich, 1415 18th Ave. West, Spencer, Iowa 51301

Filed Jun. 27, 1978, Ser. No. 919,468
Int. Cl.[2] B60R *9/00*
U.S. Cl. 224—324 6 Claims



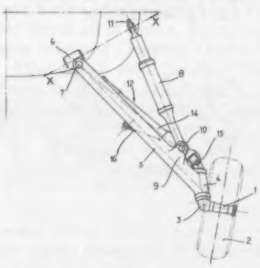
1. A ladder rack for mounting atop of a vehicle comprising,
a pair of side-frame members interconnected at opposite ends by cross-frame members,
an upstanding stop on one of said cross-frame members for engaging a rung of a ladder on one end of the ladder to limit movement of the ladder in one direction,
a spring finger extending perpendicular to said other cross frame member and being pivotable between a substantially horizontal position to an upstanding substantially vertical position for engagement with the rung of a ladder at the other end of the ladder thereby yieldably maintaining said ladder in a stationary position on said cross-frame members between said upstanding stop and said spring finger, and
lever means operatively connected to said pivotable spring finger for pivoting it between said horizontal and vertical positions,
said spring finger being further defined as an end portion of a coil spring mounted on said other cross-frame member and rotatable with said other cross-frame member by said lever means connected thereto and said end portion of said coil spring having a hook means for engaging the top side of said ladder rung at said other end of said ladder when said spring finger is in said vertical position whereby pivoting of said spring finger against the ladder rung at said other end of said ladder applied pressure to said ladder downwardly towards said cross-frame members and horizontally towards said upstanding stop whereby, rotation of said other cross-frame member against the resistance of said ladder rung of said other end of said ladder tends to wrap a coil portion of said coil spring onto said other cross-frame member thereby shortening the effective length of said end portion and thereby drawing the end portion of said spring finger downwardly against the ladder rung at said other end of said ladder.

4,170,332

RETRACTABLE UNDERCARRIAGE ESPECIALLY FOR THE FUSELAGE OF AN AIRCRAFT

Jean Masclet, Paris, and Andre Turiot, Morsang sur Orge, both of France, assignors to Messier-Hispano-Bugatti, Montrouge, France

Filed Feb. 22, 1978, Ser. No. 880,068
Claims priority, application France, Feb. 23, 1977, 77 05230; Mar. 7, 1977, 77 06624
Int. Cl.[2] B64C *25/14*
U.S. Cl. 244—102 R 13 Claims

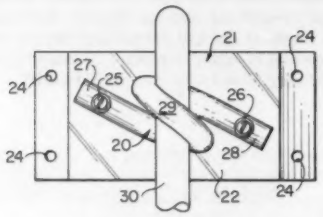


1. A retractable undercarriage for the fuselage of an aircraft, comprising for each undercarriage, on a first side, a strut pivotally coupled to the fuselage of the aircraft about an axis of retraction inclined relative to the longitudinal plane of symmetry of the aircraft and having a sleeve, a movable member pivotally mounted in said sleeve and having coupled thereto at least one wheel, and on a second side, a wind-resistant actuator jack, said strut and jack being connected to the fuselage of the aircraft by universal joints, and the movable member being connected to the jack by a universal joint, and in which a first end of an integral drive is connected to the jack, and a second end of the integral drive is connected to the strut, such that during operation of the undercarriage, controlled by the jack, the relative movement of the strut relative to the jack combined with the restraint of the integral drive, causes a rotation of the jack which results in a rotation of the movable member in the sleeve to cause the wheels to undergo a positioning movement complementary to a movement of the undercarriage about the axis of retraction.

4,170,333
HANGER DEVICE AND METHOD FOR SUSPENDING AN IMPLEMENT

Leonard W. Angelastro, South Windham, Conn., assignor to John W. Stevens, Columbia, Conn.

Continuation-in-part of Ser. No. 736,129, Oct. 27, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 844,536
Int. Cl.[2] A46B *17/02*
U.S. Cl. 248—110 5 Claims

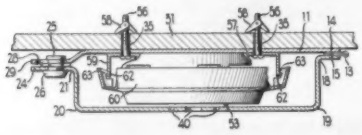


1. A method of suspending an implement of the type having an elongated handle or end portion comprising forming an elongated flexible member of stretch-resistant material into a spiral loop, securing the loop to an upright supporting surface with the loop disposed in a plane substantially at right angles to the supporting surface but with the bight of the loop at an acute angle to the vertical, tilting the implement so that the elongated handle or end portion is in alignment with the axis of the loop and inserting it endwise through the loop, and thereafter turning the implement to vertical position to twist the loop and cause it to tighten around the handle or end portion.

4,170,334
THEFT-DETERRENT BRACKET FOR SMOKE ALARMS

Charles V. Villanueva, 5704 W. Windsor, Chicago, Ill. 60630

Filed Aug. 24, 1977, Ser. No. 827,268
Int. Cl.[2] A47B *96/06*
U.S. Cl. 248—553 11 Claims



1. A theft-deterrent bracket for a smoke alarm having a cover and a fastening device engageable with a room surface for attaching said alarm to said surface, said bracket comprising:

(A) a first rigid part including affixing means for holding said first part adjacent to said room surface;

(B) a second rigid part;

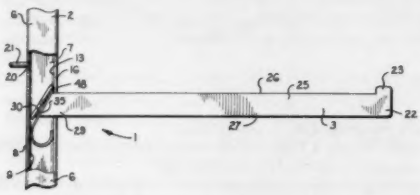
(C) holding means permanently coupled to said first and said second parts for retaining said first and second parts in proximity to each other; and p1 (D) locking means permanently affixed to at least one of said first and second parts and having first and second configurations, for, in the first and second configurations, fixedly retaining said first and second parts in contact with each other, said locking means including means for limiting its unauthorized movement from said first to said second configurations,

said first and second parts, when retained in contact with each other by said locking means and with said first part held adjacent to said room surface by said affixing means, including (a) coupling means adapted to maintain said first and second parts in a fixed orientation relative to said cover of said alarm and, when thus maintained in said fixed orientation relative to said cover by said coupling means, adapted to prevent disengagement of said fastening device to allow the removal of said cover from said room surface and (b) protecting means for substantially preventing access to said locking means.

4,170,335
INFINITELY ADJUSTABLE SUPPORT BRACKET

Harold L. King, Liberty, Mo., assignor to William C. Rodgers, Maryland Heights, Mo.

Filed May 19, 1978, Ser. No. 907,604
Int. Cl.[2] A47G *29/02*
U.S. Cl. 248—246 2 Claims



1. An infinitely adjustable support structure comprising:

(a) an upright member fixed in position and having an interior way with spaced, opposed, front and rear surfaces and an elongate opening;

(b) a bracket member having an elongate arm with a latch portion at one end, said latch portion being in said interior way and said arm extending forwardly therefrom through said opening;

(c) said latch portion being in fixed relation to said arm and inclined relative thereto with opposed edges for holding engagement with said front and rear surfaces respectively in response to a load on said arm;

(d) a resilient member connected to the arm and the latch portion and having a gripping portion extended therefrom, said gripping portion resiliently engaging said front and rear surfaces and exerting pressure on said latch portion to urge same into inclined relationship; and

(e) said arm being released for vertical movement when said arm is raised, releasing said opposed edges of said latch portion from engagement with said front and rear surfaces, and whereby the resilient member urges downward rotation of the arm in response to raising the arm for re-engagement of said latch portion with said front and rear surfaces.

4,170,336
SUSPENSION APPARATUS FOR OPERATING ROOM MICROSCOPE

Leonard I. Malis, 219-44 Peck Ave., Hollis Hills, N.Y. 11423

Filed Dec. 16, 1977, Ser. No. 861,359
Int. Cl.[2] G02B *23/16*
U.S. Cl. 248—276 8 Claims

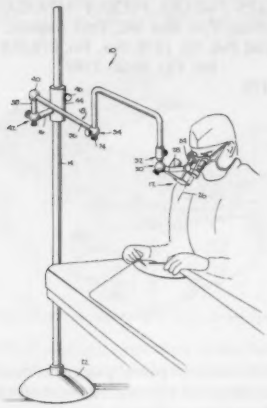
1. Suspension apparatus for rotatably supporting an operating room microscope comprising

a C-shaped suspension arm having a central portion, an end portion disposed at a substantially right angle to the central portion and suspension arm coupling means disposed at said end portion, and

microscope coupling means comprising a first swivel joint having a first female member which includes a bore disposed therein at an angle of from about 140° to about 160° from the vertical with reference to the mounted position of said first female member, said bore being adapted to rotatably receive a shaft which is connected to a member which is pivotably connected to the microscope,

said suspension arm coupling means rotatably coupling said microscope coupling means to said end portion and comprising a second swivel joint having a second female member and a male member, one of said second female

member and said male member being disposed at said end portion of said suspension arm and the other of said female member and said male member being connected to said first female member of said first swivel joint,



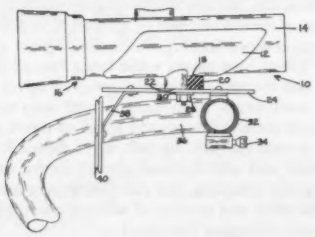
whereby the microscope is adapted to being rotated in the vertical plane at angles of up to from about 140° to about 160° between the vertical and the axis of vision of the microscope.

4,170,337

BICYCLE ACCESSORY

Milton S. Davis, 105 Oak Ave., Kentfield, Calif. 94904

Filed May 19, 1978, Ser. No. 907,807
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—475 R **3 Claims**



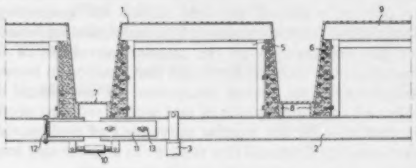
1. A flashlight holder comprising:
a flexible concave clip adapted to receive and retain a conventional cylindrical flashlight case, the outer surface of said clip being cylindrically convex;
a resilient washer of a material with a high coefficient of friction;
a flat surface and a cylindrical concave surface on opposite sides of said washer;
said clip being nested and interlocked in said concave surface;
a base plate having planar surfaces;
a threaded member for clamping said clip and resilient washer to said base plate;
a nut on said threaded member; and
a washer having a low coefficient of friction interposed between said nut and base plate to facilitate turning said concave clip and said resilient washer as a unit thereon.

4,170,338

FLOOR SHUTTERING

Sven F. Nilsson, Huddinge, Sweden, assignor to P-Form AB, Soderbarke, Sweden

Filed Nov. 10, 1977, Ser. No. 850,700
Claims priority, application Sweden, Nov. 12, 1976, 7612692
Int. Cl.[2] E04G *11/40*
U.S. Cl. 249—31 **6 Claims**



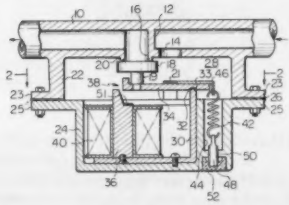
1. A floor shuttering comprising a number of elongated, inverted trough-shaped core forms arranged parallel to each other having their adjacent side-walls mutually spaced and supported by support means on beams extending perpendicular to the longitudinal direction of the forms, and joining means joining the lower edges of adjacent side-walls of said forms, so as to close mutual spaces between adjacent side-walls at their lower edges, said support means comprising inverted U-shaped support frame means corresponding in number to the number of forms, mounted on said beams within a respective form, and two retaining and stiffening wall members connected to each of said support frame means and extending on the inside of the side-walls of said forms for strengthening against external pressures, said beams being carried by a movable frame structure means in a vertically adjustable position.

4,170,339

ANALOG DISPLACEMENT TYPE ELECTROMAGNETIC VALVE

Yasukiyo Ueda; Keijiro Mori; Keiichi Mori; Takashi Tanahashi, and Shigeru Shirai, all of Osaka, Japan, assignors to Matsushita Electric Industrial Company, Osaka, Japan

Filed Apr. 7, 1977, Ser. No. 785,773
Claims priority, application Japan, Apr. 8, 1976, 51/40010
Int. Cl.[2] F16K *31/06;* **H01F** *7/13, 7/14*
U.S. Cl. 251—138 **13 Claims**



1. An electromagnetic valve comprising:
a stationary magnetic core member having first and second mutually angled straight pole face surfaces;
a movable magnetic core member disposed in opposed relation to said stationary core member and pivoted at one end so as to be rotatable between first and second positions and having a free end with first and second mutually angled straight pole face surfaces which confront the first and second mutually angled straight pole face surfaces of the stationary core member forming first and second air gaps;
means for urging said movable core member toward said first position;
means for magnetizing said stationary and movable core members to produce a force acting on said movable core member to rotate the movable core member toward the second position;

said first air gap being formed between the first pole face surface of said stationary and movable core members to provide a first working section for generating a transverse vector component of said force, said first air gap decreasing with the angular movement of said movable core member from said first position to increase said transverse vector component of said force;

said second air gap being formed between the second pole face surfaces of said stationary and movable core members to provide a second working section for generating a longitudinal vector component of said force, said second air gap decreasing with the angular movement of said movable core member from said first position to increase said longitudinal vector component of said force, the effective confronting area of said second working section increasing with the angular movement of said movable core member from said first position to increase said longitudinal vector component of said force; and

means coupled to one of the core members for forming a fluid passage such that the amount of the passing fluid is proportional to the angular displacement of said movable core member from said first position.

4,170,340

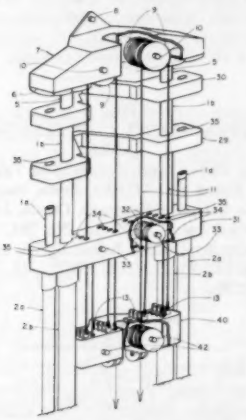
HYDRAULIC WELL DERRICK WITH CABLE LIFTS

William J. Mouton, Jr., Box 10515, New Orleans, La. 70123

Filed May 25, 1977, Ser. No. 800,486

Int. Cl.[2] B66D *3/08*

U.S. Cl. 254—189 **9 Claims**



1. In a well derrick, wherein lifting is secured by the use of pairs of vertical, parallel hydraulic cylinders straddling the well centerline, with rams extending upward from the cylinder tops, the heads of the rams being bridged by a crosshead beam from which depends cable means supporting a travelling beam, the improvement comprising in cooperative combination:

a cylinder beam bridging the tops of the said cylinders;

sheave means comprising at least one sheave carried on each of the said crosshead beam and the said travelling beam and said cylinder beam;

cable means comprising at least one cable with one end attached to one of said beams, then strung in sequence around sheaves on the other ones of said beams, and ending in an attachment to said one of said beams; wherein (a) the said sheave means together comprises at least one set of sheaves, said set being said at least one sheave on each beam and (b) the said cable means together comprises a separate cable for said at least one set of sheaves, each cable having one end attached to the travelling beam, the cable then being strung in sequence around a sheave in the cylinder beam, a sheave in the travelling beam, a sheave in the crosshead beam, and ending in an attachment to the travelling beam.

4,170,341

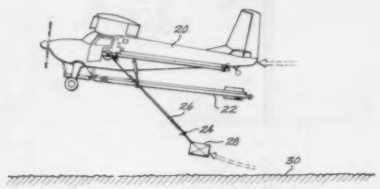
AIRCRAFT PARCEL-PICKUP MECHANISM

Darwin J. Jacobson, P.O. Box 962, Port Angeles, Wash. 98362

Filed Feb. 21, 1978, Ser. No. 879,365

Int. Cl.[2] B66D *1/48*

U.S. Cl. 254—172 **15 Claims**



1. A combination aircraft parcel pickup mechanism comprising a frame carried by said aircraft; a drive shaft carried by said frame; a first sheave means fixed on said drive shaft for receiving a parcel-pickup cord means for picking up a parcel, said parcel-pickup cord means having one end portion thereof connected with said first sheave means and also being reeved onto said first sheave means when said first sheave means and said drive shaft are turning in a given direction and said parcel-pickup cord means being reeved off said first sheave means when said drive shaft and said first sheave means are turning in an opposite direction to said given direction; a second sheave fixed on said drive shaft; spring cord means having one end portion thereof connected with said frame and at a location remote from said second sheave and having the other end portion thereof connected with said second sheave and also being reeved onto said second sheave when said second sheave and said drive shaft are turning in said opposite direction and said spring cord means being reeved off of said second sheave when said drive shaft and said second sheave are turning in said given direction, the said spring cord means functioning to turn said second sheave and said drive shaft in said given direction; lineal-travel-speed-limiting means limiting the speed of travel of said spring cord means while being reeved off said second sheave and thereby limiting the speed of travel of the parcel-pickup cord means when being reeved onto said first sheave means and thereby limiting the speed of travel of a picked up parcel toward the said aircraft; drive means for turning said drive shaft and said first and second sheave fixed thereon in said opposite direction; and parcel-engaging means connected with the other end portion of said parcel-pickup cord means for directly engaging the parcel.

4,170,342

PIVOTAL ROOF FENCE APPARATUS

Silas N. Miller, 15300 Kittridge Rd., Saratoga, Calif. 95070, and Otis M. Martin, 5624 Bodie Ct., San Jose, Calif. 95123

Filed Apr. 6, 1978, Ser. No. 894,125

Int. Cl.[2] E04H *17/16*

U.S. Cl. 256—26 **10 Claims**

1. A pivotal fence unit, comprising:

base means adapted for attachment to a horizontally disposed support surface;

a fence structure disposed above said base means and including

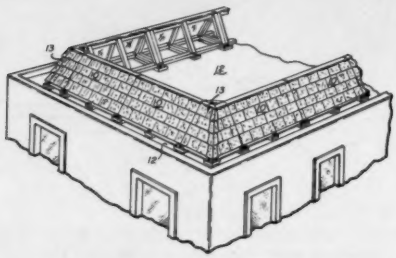
first means forming an upstanding decorative outer fence surface,

buttress means affixed to an upper portion of said first means to provide lateral support therefor, and

second means forming cross members rigidly securing a

lower portion of said first means to a lower portion of said buttress means; and

hinge means affixing a first side of said fence structure to said base means so as to permit said fence unit to be rotated about a first axis from a first position directly above said base means to a second position, and further affixing a



second side of said fence structure to said base means so as to permit said hinge structure to be rotated about a second axis from said first position to a third position, said hinge means including hinge elements comprised of a first plate attached to said fence structure, a second plate attached to one of said base means, and a removable hinge pin pivotally coupling said first plate to said second plate.

4,170,343

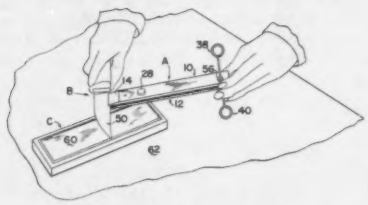
KNIFE SHARPENER

Howard R. Longbrake, R.D. 2, Grafton, Ohio 44044

Filed Aug. 3, 1978, Ser. No. 930,747

Int. Cl.[2] B25B *3/00*

U.S. Cl. 269—3 **4 Claims**



1. A portable work holder for positioning and maintaining an article being sharpened, such as a knife, or the like, in predetermined position relative to a planar surface of a stationary abrasive member or stone during manual manipulation of the article relative to the abrasive member for the purpose of sharpening the same, comprising two clamp members having opposed planar surfaces and a bevel on the opposite side of each member at one end thereof, means pivotally connecting said clamp members to one another with their bevelled ends adjacent to one another, means for forcing the bevelled ends of said clamp member towards one another, and a member connected to each clamp member and projecting a substantial distance from said bevelled sides of said clamp members adjacent to the ends of said clamp members other than said bevelled ends thereof.

4,170,344

APPARATUS FOR THE SEPARATION OF A MIXTURE OF COMPONENTS, PARTICULARLY MOLTEN METALS, METAL COMPOUNDS AND/OR METAL CONTAINING SLAGS IN A CENTRIFUGAL FORCE FIELD

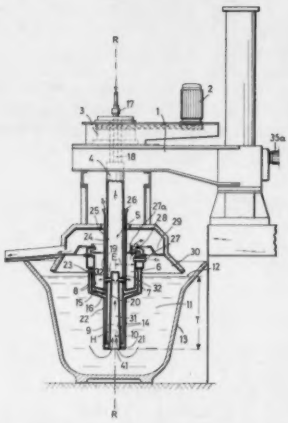
Friedrich Megerle; Alfred Kryczun, and Willy Jakobs, all of Cologne, Fed. Rep. of Germany, assignors to Klöckner-Humbolt-Deutz AG, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,496

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2707726

Int. Cl.[2] C22B *9/02*

U.S. Cl. 266—204 **16 Claims**



1. An apparatus for the separation of components such as molten metals, metal compounds or metal containing slags by centrifugal force, comprising in combination:

a centrifugal body rotatable on a vertical axis forming a separating chamber at its lower end with a lower concentric opening for immersion below the level of a liquid material to be separated;

first and second openings in the upper area of the centrifugal body for receivving separated components, said openings having spacing from the axis of rotation of the body greater than the radius of the concentric opening;

a universal suspension at the upper end of said body with the body depending downwardly therefrom;

and a rotational drive connected to the upper end of said body.

4,170,345

HOLDING CLAMP ASSEMBLY

Ralph G. Townsend, 4882 J Pkwy., Sacramento, Calif. 95823

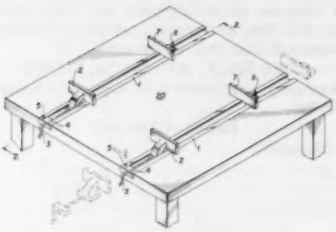
Filed Dec. 13, 1977, Ser. No. 860,050

Int. Cl.[2] B25B *1/02*

U.S. Cl. 269—88 **9 Claims**

1. An apparatus for clamping objects to be worked on to a work table comprising at least one channel disposed within a top face of said work table, and means slideably disposed within said channel to constrain the object to be worked on so that when said means to constrain are removed, the top face of said work table is free from any upstanding projections, said means to constrain the object to be worked on comprises a first clamp member having a portion slideably disposed within said channel provided with means to coact against said channel to constrain said first clamp from displacement within said channel, and a face member extending above said channel which opposes a face disposed on a second clamp member which has a portion that rides in said channel and is constrained from motion by means of a shaft having threads thereon connected

to said second clamp at one extremity and further connected to a handle at the other extremity through a thrust block and thrust washer fastened to said channel by a lock pin and wherein said means to constrain said first clamp in said channel



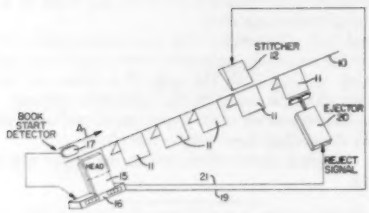
comprise rack means disposed in said channel and a pawl disposed within said first clamp having biasing means disposed thereabout and a lever connected thereto to engage said pawl against said rack and to remove said pawl from contact with said rack.

4,170,346

BINDERY CALIPER

Robert R. Murray, Indialantic, Fla., and Dale H. Jackson, Bethlehem, Pa., assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 3, 1977, Ser. No. 848,262
Int. Cl.[2] B65A *39/02*
U.S. Cl. 270—54 **26 Claims**



1. In a book binding apparatus of the type having means for conveying a series of unstitched books along an established path and means for stitching the books disposed at a location along said path, an improved page counting system for counting the pages in each book as it proceeds along the path on said conveying means comprising:

(a) capacitor means having a pair of spaced conductive plates disposed along said path so that the pages of each book sequentially pass through the space between the plates as the books are conveyed by said conveying means to said stitching means;

(b) oscillator means coupled to said capacitor means to form therewith an oscillator producing a variable frequency of oscillation proportional to the number of pages of a book passing between said conductive plates; and

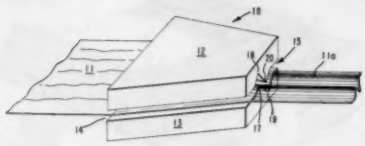
(c) means for comparing the frequency of oscillation of said oscillator with a standard to determine whether the total number of pages of each book is equal to the number designated by said standard.

4,170,347

WEB PLEATER

Robert B. Lewis, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 808,996, Jun. 22, 1977, abandoned. This application May 18, 1978, Ser. No. 907,279
Int. Cl.[2] B65H *45/22*
U.S. Cl. 270—94 **13 Claims**



1. A pleating device comprising

a first air feed plenum having an inlet end and an outlet end

a transversely irregular surface on the first plenum, flat at the inlet end and progressing over the length of the surface to at least one peak at the outlet end

a multitude of louvers in the surface on the first plenum, said louvers being from 2 to 15 centimeters long which is less than one-fourth the width of the surface on the first plenum, spaced more than one-fourth and less than three louver lengths apart, and directed toward the outlet end

a second air feed plenum having an inlet end and an outlet end

a transversely irregular surface on the second plenum mating with the surface of the first plenum and juxtaposed in a spaced-apart relation thereto;

a multitude of louvers in the surface on the second plenum, said louvers being from 2 to 15 centimeters long which is less than one-fourth the width of the surface on the second plenum, spaced more than one-fourth and less than three louver lengths apart, and directed toward the outlet end.

12. A process for pleating a moving web of flexible material comprising:

applying balanced longitudinal pneumatic forces to a wide web of the material over a predetermined length of the web to hold the web under tension while simultaneously

applying transverse pleating forces to the web under tension over the predetermined length of the web to collapse the wide web into a pleated structure; and

moving the web in the direction of the tension to continually apply balanced longitudinal and transverse forces to the moving web;

whereby the wide web is continually collapsed to a pleated structure.

4,170,348

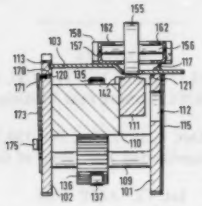
TRANSPORT DEVICE FOR READING OF IDENTIFICATION CARDS

Helmut Höeink, Borchen; Waldemar Jaëger, Elsen; Peter Scholich, Sande; Rolf Roeschlein, Paderborn, and Helmut Podtschaske, Sande, all of Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Fed. Rep. of Germany

Filed Apr. 6, 1977, Ser. No. 785,017
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618439
Int. Cl.[2] B65H *9/00*
U.S. Cl. 271—240 **23 Claims**

1. A transport device for the reading of identification cards such as ID cards, credit cards and the like during linear movement of the cards along a transport course in a transport plane, said device having a housing, said cards being introduced through a feeding slot in said housing and means for transporting the cards past a reading unit, characterized by the housing having a longitudinal guide slot arranged along both sides of

the transport course for receiving the longitudinal sides of the cards to be processed, said transport means comprising an endless conveyor belt having a pushing element which abuts against the transverse sides of the cards, a belt routing roller being arranged immediately after the feeding slot and means for aligning said cards relative to said guide slots, said aligning means comprising an elongated guide rail longitudinally positioned in one guide slot and spring means for laterally urging said guide rail toward the other guide slot, and wherein at least



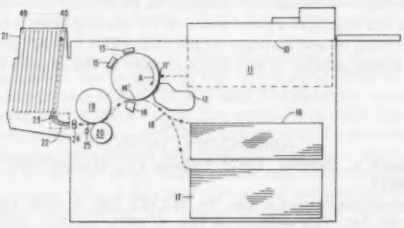
one guide slot is formed in a side plate of the housing, and wherein said aligning means further comprises a pressure plate positioned along an external side of the side plate, said pressure plate engaging said guide rail at at least two longitudinally spaced points against said guide rail and extending downwardly therefrom, and wherein said spring means further comprises a spring member which resiliently engages said pressure plate at a point below the transport plane of the device.

4,170,349

SELF-CONTAINED MOTOR-DRIVEN COLLATOR DEFLECTOR

Gerald W. Baumann, Boulder, Colo.; Joseph L. Gambrell, Lexington, Ky.; George F. Hayes, Niwot, Colo.; Francis J. Schell, and Allen G. Schulte, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,207
Int. Cl.[2] B65H *29/60, 31/24*
U.S. Cl. 271—296 **15 Claims**



1. A self-contained deflector unit in a collator/sorter having a plurality of sheet-receiving bins, each opening along a path, said deflector unit being movable for selecting one of said bins, comprising:

a frame;

means mounting said frame for movement along said path, including frame moving means operable to move said frame into a plurality of feeding positions in proximity to the bin openings between an initial and a final position;

sheet transport means mounted on said frame for feeding sheets into said bins;

first electric motor means mounted on said frame for driving said sheet transport means;

second electric motor means mounted on said frame for driving said frame moving means to increment said deflector unit in a first direction to a position in feeding relationship to a selected bin; and

decrementing motor means mounted on said frame for driving said frame moving means to decrement said deflector unit in a second direction to a position in feeding relationship to a selected bin, and said second electric motor means acts as a dynamic brake to control the speed of said deflector unit when moving in said second direction.

7. In a document copier machine, including processing stations such as imaging, developing and fusing stations, for feeding a sheet of finished copy to a collator/sorter having a plurality of vertically oriented bins, the improvement comprising:

a movable deflector unit in said collator/sorter for moving along a path to an opening in a selected one of said bins, said collator/sorter having a frame with sheet transport means mounted thereon for feeding sheets into said bins;

first electric motor means mounted on said frame for driving said sheet transport means at a plurality of speeds;

second electric motor means mounted on said frame for incrementing said deflector unit in a first direction to a position in feeding relationship to a selected bin;

decrementing motor means mounted on said frame for decrementing said deflector unit in a second direction to a position in feeding relationship to a selected bin; and

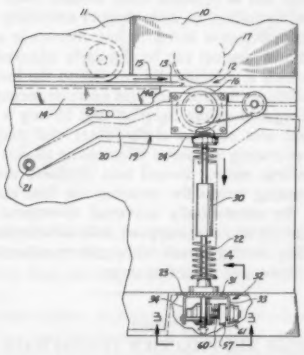
means to determine when a sheet leaves the final of said processing stations for increasing the speed of said transport means from a first speed synchronized with the speed of said sheet through said machine to a second speed sufficient to provide a final upwardly directed impetus of said sheet into the bottom of said bins.

4,170,350

MAIL HANDLING APPARATUS

Joseph A. Conti, Whitestone, N.Y., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 23, 1977, Ser. No. 863,928
Int. Cl.[2] B65H *5/06*
U.S. Cl. 271—274 **3 Claims**



1. In a mail handling apparatus having a work station and including:

a mail piece handling assembly pivotably supported in said apparatus;

means for movably supporting said assembly whereby said assembly may be displaced in accordance with the varying thicknesses of the respective mail pieces moving to and through said work station; and

biasing means for yieldably maintaining said assembly in a normal position:

the improvement comprising:

one-way braking means including a shaft, a one-way clutch mounted on said shaft for permitting rotary movement of said shaft in one direction only relative to said clutch, and a coupling yieldably connecting said shaft to said support means, such that when mail pieces are fed into said work station said assembly may yieldably deflect away from its normal position and rotate said shaft unrestrained by said

braking means but will be braked by said one-way clutch and yieldable coupling in moving back towards said normal position thereby minimizing the shock and noise generated by the restoration of said mail handling assembly to its said normal position.

4,170,351

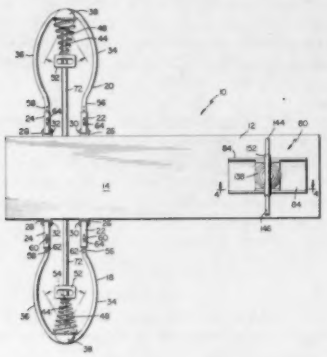
SPRING-TYPE ARM AND LEG EXERCISER

Ahmet M. Ozbey, and Amber L. Ozbey, both of 205 Bonhill Dr., Ft. Washington, Md. 20022

Filed Oct. 6, 1977, Ser. No. 840,091

Int. Cl.[2] A63B *21/00, 23/04*

U.S. Cl. 272—134 **16 Claims**



1. An exercise apparatus comprising elongated platform means for supporting the body of a user in the prone position and arm exercise means mounted on said platform means near one end thereof and at opposite sides thereof, each said arm exercise means including an arm support extending laterally from said platform means and attached thereto in a manner such that said arm support can be angularly adjusted about a pivotal axis which is substantially parallel to the longitudinal axis of said platform means, said arm exercise means also including an elongated spring exercise unit having a first end secured to said arm support at the outer end thereof, said exercise unit extending in spaced relationship to said arm support and platform means toward said platform means, and universal mounting means for securing the first end of said exercise unit for substantially universal movement about a mounting point on said arm support, said universal mounting means including biasing means to oppose movement of said exercise unit about said mounting point.

4,170,352

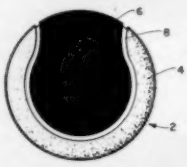
VISUAL AID PRACTICE TENNIS BALL

Vlastimil Vcala, 1228 - 12th St., Santa Monica, Calif. 90401

Continuation of Ser. No. 619,825, Oct. 6, 1975, abandoned. This application Jul. 18, 1977, Ser. No. 816,895

Int. Cl.[2] A63B *61/00*

U.S. Cl. 273—29 A **1 Claim**



1. A conventional tennis ball having a cover comprised of two identically shaped panels of the same size, each panel having rounded ends and concave sides, with a length sufficient to permit each panel to extend partially around the ball such that the geometric center of each rounded end will be diametrically opposite the geometric center of the other rounded end, said centers of a panel being aligned on a common axis passing through the center of said ball, and the axis of one panel being normal to the axis of the other panel, and one panel having a color contrasting with the color of the other panel as an aid to detecting spin imported on the ball while in play.

4,170,353

TABLE FOOTBALL GAME WITH ACTUATING RODS

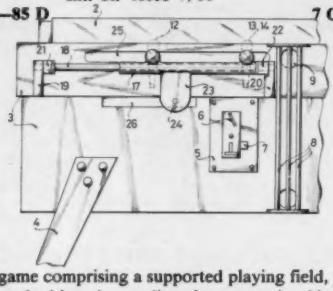
Xaver F. Leonhart, 8381 Harburg near Pilsting, Ndb., Fed. Rep. of Germany

Filed Oct. 4, 1977, Ser. No. 839,209

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645741

Int. Cl.[2] A63F *7/06*

U.S. Cl. 273—85 D **7 Claims**



1. A table game comprising a supported playing field, guide means connected with and extending along opposite sides of at least a portion of said playing field, carriage means mounted for longitudinal movement along said guide means, a pair of actuating rod means connected parallel to each other and extending above and laterally of said playing field and movably connected to said carriage means, said pair of actuating rod means spaced from each other in the longitudinal direction of the playing field, and player pieces connected on said pair of actuating rod means and adapted to be moved into contact with and to propel a game piece on the playing field, whereby movement of said carriage means moves said pair of actuating rod means parallel to and longitudinally of the playing field.

4,170,354

AMUSEMENT DEVICE

Kenneth A. Bredlau, 15675 LaBella Ct., Morgan Hill, Calif. 95037

Continuation-in-part of Ser. No. 712,782, Aug. 9, 1976, Pat. No. 4,066,265. This application Dec. 9, 1977, Ser. No. 859,120

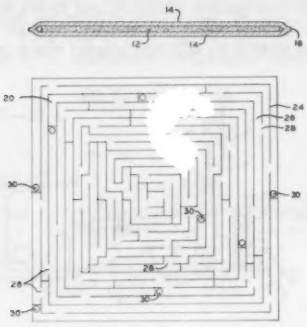
Int. Cl.[2] A63F *9/06*

U.S. Cl. 273—153 R **1 Claim**

1. An amusement device of laminated construction comprising in combination:

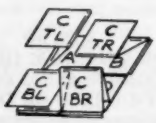
A. a maze card including a pair of oppositely related planar faces having indicia printed thereon for defining on the faces a singular path extending between the periphery of the card and its center including a plurality of straight lines arranged in both parallel and intersecting relation for forming a labyrinth of segments of said path, said lines being characterized by hiatuses defining first gate means joining adjacently related path segments on each of the oppositely related faces, further indicia defining on each of said faces a plurality of dots disposed in said path segments, at least one dot on each face being registered with a dot on the other face of the card for defining at least one second gate means between the faces for connecting segments of the path in communication;

B. laminae for transparent synthetic resin sandwiching said card therebetween; and



C. a marking device for applying removeable tracing marks to the surface of the laminae.

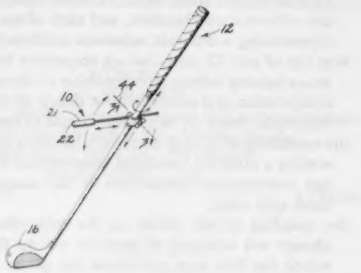
4,170,355
EDUCATIONAL PUZZLES
Stephen E. Finkin, 39 W. 83rd St., New York, N.Y. 10024
Filed Oct. 6, 1977, Ser. No. 840,112
Int. Cl.[2] A63F *9/08*; G09B *1/32*
U.S. Cl. 273—155 **10 Claims**



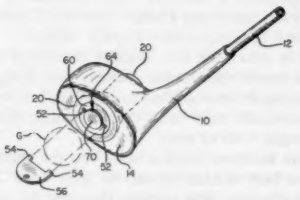
1. A puzzle, comprising:
(a) a central planar member;
(b) a plurality of planar arm members extending from said central planar member, the obverse and reverse of each of said arm members being divided into demarcated areas and adapted to be folded at the boundaries between said demarcated areas; and
(c) a first group of items of information disposed on said arm members, one in each of said demarcated areas on the obverse and reverse of said arm members, the arrangement of said items in said first group being such that the arm members may be folded to form one of a plurality of message pairs, one of said messages of said pair appearing on the obverse of the folded puzzle and composed of some of said items and the other message of said pair appearing simultaneously on the reverse of the folded puzzle and composed of others of said items and said items in said first group being positioned, configured and dimensioned so that when one message of a message pair appears on one side of the folded puzzle, only the other message of the message pair can be formed on the other side.

4,170,356
GOLF SWING TRAINING DEVICE
James F. Banks, P.O. Box 67, East Haddam, Conn. 06423
Filed May 17, 1978, Ser. No. 907,156
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 A **7 Claims**

7. The combination comprising a golf club having an elongated shaft and a golf swing training device releasably secured to said golf club and having a mounting bracket attached to said shaft, a single fastener having a head at one end and an elongated threaded shank projecting from said head and extending through said mounting bracket, said head having an aperture therethrough, a rod extending through said aperture and projecting outwardly in opposite directions beyond said head, a clamping sleeve carried by said fastener and at least partially disposed on said head in bearing engagement with said mounting bracket and said rod, and a nut threadably engaged with said shank and engaging said mounting bracket, said single fastener cooperating with said mounting bracket and said sleeve to releasably secure said mounting bracket to said club shaft and to releasably secure said rod in selected fixed position relative to said shaft.



4,170,357
GOLF CLUB
George C. Greer, 2115 N. Crater La., Newberg, Oreg. 97132
Filed Apr. 17, 1978, Ser. No. 896,710
Int. Cl.[2] A63B *53.04*
U.S. Cl. 273—167 R **11 Claims**



1. In an athletic club having a shaft portion extending between a handle portion and a head portion which includes a ball-striking face, the improvement wherein said head portion comprises:
propulsion means including a charge receiving means for holding and positioning a propellant charge such that when said charge is detonated, said heat portion is accelerated in the direction of said ball-striking face; and
means for detonating a propellant charge held by said charge receiving means, when said ball-striking face comes into contact with a ball, to accelerate said head portion toward said ball.

4,170,358
PLAYING CARDS
Herbert C. Hancock, 9 Penge Ct., Dundas, Ontario, Canada (L9H 4R3)
Filed Nov. 18, 1977, Ser. No. 852,831
Int. Cl.[2] A63F *1/02*
U.S. Cl. 273—304 **6 Claims**

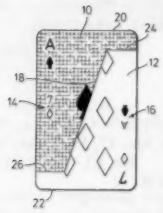
1. A pack of playing cards comprising 52 cards, each of said cards being of generally the same rectangular configuration and standard size, and having visually similar rear faces;
each of said cards being split to prove a front face divided

into first and second visually distinctive zones, each of said first and second zones bearing readily recognizable indicia representative of a standard playing card value selected from deuce through ace of a standard playing card suit selected from club, diamond, heart and spade, each of the first zones of the 52 cards representing a different value-suit combination, and each of the second zones representing a different value-suit combination;

four out of said 52 cards having respective first and second zones bearing indicia representative of the same suit-value combination and selected from deuce of clubs, deuce of diamonds, deuce of hearts and deuce of spades;

the remaining 48 of said cards each having a first zone representing a different value-suit combination from the value-suit combination represented by the second zone of the same split card,

the coupling of suit values on the split-value cards being chosen and arranged to provide, among the 12 cards in which the first zone represents the values three through ace of a given suit selected from clubs, diamonds, hearts and spades, that there are 3 cards of which the second zone represents a club value, 3 cards of which the second



zone represents a diamond value, 3 cards of which the second zone represents a heart value and 3 cards of which the second zone represents a spade value;

each card in which the first visually distinctive zone represents an honor card value (namely ace, king, queen or jack) having its second visually distinctive zone representing a non-honor card value (namely three, four, five, six, seven, eight, nine or ten);

the division between the first zone and the second zone of the front face of each of said 48 split value cards being along a diagonal line passing through the approximate diagonal center of the respective split-value card and extending diagonally from the approximate diagonal center towards opposed points on the shorter side of the card located from ½ cm to 2 cm from the top right and bottom left corners of the front face of the card, as the card is held upright and viewed toward the front face, the division line at a point ½-1 ½ cm from the respective shorter sides making obtuse angled turns and proceeding parallel with said shorter sides to intersect the respective longer sides a distance of about ½-1 ½cm from the respective top right and bottom left corners.

4,170,359

GRAMOPHONE EQUIPMENT

Leslie A. Leech, and Henry J. Riddoch, both of Fife, Scotland, assignors to Pico Electronics Limited, Fife, Scotland

Filed Oct. 7, 1977, Ser. No. 840,342

Claims priority, application United Kingdom, Oct. 11, 1976, 42237/76; Jun. 3, 1977, 23775/77

Int. Cl.[2] G11B *17/08*

U.S. Cl. 274—10 R **21 Claims**

16. Phonograph record changer equipment comprising:

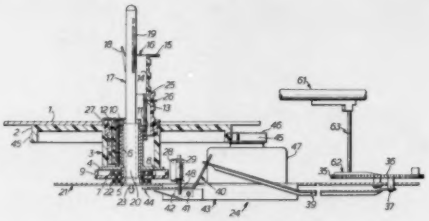
(a) first support means;

(b) a turntable rotatably mounted relative to said first support means;

(c) second supporting means for supporting a stack of phonograph records above said turntable and for releasing records one-by-one from the stack onto said turntable;

(d) rotary drive means;

(e) a screw arrangement driven by said rotary drive means and having telescopic screw-threaded parts for displacing a record relative to said first support means in the axial



direction of said turntable responsive to said rotary drive means to extend and retract one part of the screw arrangement in the axial direction, said one of said telescopic screw-threaded parts arranged for carrying a record; and

(f) control means for enabling said screw arrangement to extend and retract from said turntable.

4,170,360

APPARATUS FOR ADJUSTING THE POSITION OF AN ARM IN A RECORD PLAYING DEVICE, SUCH AS A PHONOGRAPH OR THE LIKE

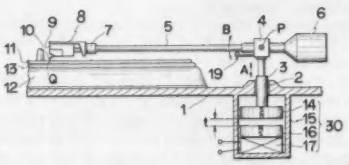
Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 18, 1978, Ser. No. 897,396

Claims priority, application Japan, Apr. 22, 1977, 52-45801

Int. Cl.[2] G11B *3/10*

U.S. Cl. 274—23 R **15 Claims**

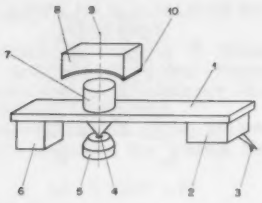


1. Apparatus for controlling an arm of a record player of the type having a base, a turntable upon which a record disc rotates, a pivot support extending upward from said base for supporting said arm and about which said pivot support arm pivorts in a plane perpendicular to the surface of said record disc, and a transducer at one end of said arm for scanning said record disc, said apparatus comprising means for detecting pivotal movement of said arm about said pivot support to produce a position signal representing the angular position of said arm; detecting menas for detecting when said position signal differs from a predetermined reference level, corresponding to an angular displacement of said arm to produce a control signal; and drive means coupled to said pivot support and responsive to said control signal for driving said pivot support in a direction perpendicular to said surface of said record disc so as to reduce said angular displacement of said arm and thereby drive said position signal to said predetermined reference level.

4,170,361
BEARING ARRANGEMENT FOR A RECORD PLAYER TONEARM

Paul Zwicky, Dielsdorf, and Eduard Marthaler, Zürich, both of Switzerland, assignors to Willi Studer, Switzerland

Filed May 2, 1978, Ser. No. 902,217
Claims priority, application Switzerland, May 13, 1977, 6046/77
Int. Cl.[2] G11B *3/12*
U.S. Cl. 274—23 A 8 Claims



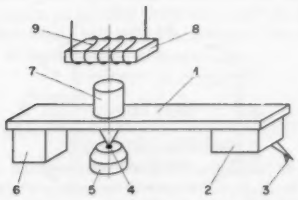
1. A pickup arm device for a record player, the device being of the type which has a short pickup arm and is guided along a guide direction substantially parallel to a radius of the record to be played by the record player, so that the arm remains oriented substantially tangential to the grooves of the record, wherein the improvement comprises:

thrust bearing means for supporting said arm mechanically from below at only a single point, said thrust bearing means having a movable bearing member with a movable bearing axis and a fixed bearing member with a fixed bearing axis, said movable bearing member being fastened to said pickup arm, and magnetic means including a movable magnetic member fastened to said arm and a fixed magnetic member separated from said movable magnetic member by an air gap and fixed in relation to said fixed bearing member for acting through said air gap to partially support said arm from above and constrain its movement to a rotation about said movable bearing axis and a pivoting of said movable bearing axis in a plane substantially perpendicular to said guide direction.

4,170,362
BEARING ARRANGEMENT FOR A RECORD PLAYER TONEARM

Paul Zwicky, Dielsdorf, and Eduard Marthaler, Zürich, both of Switzerland, assignors to Willi Studer, Switzerland

Filed Aug. 31, 1978, Ser. No. 938,643
Claims priority, application Switzerland, Sep. 5, 1977, 10770/77
Int. Cl.[2] G11B *3/12*
U.S. Cl. 274—23 A 7 Claims



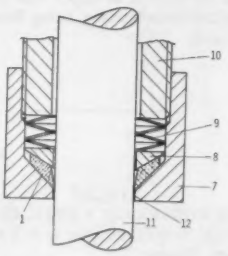
1. In a record player of the type having a short tonearm having a thrust bearing means for supporting said arm from below at only a single point, said tone arm having a stylus adjacent one end and a first magnet fixed to the tonearm and interacting with a second, stationary magnet closely spaced from the first magnet, the magnets preventing sideways tilting of the tonearm in planes other than the plane containing the longitudinal axis of the axis and said single point while permitting pivoting of the arm to raise and lower the stylus, the improvement comprising:

an electrical winding about the second magnet, for generating a supplemental magnetic control field to affect in a controlled manner the interaction between the first and second magnets, and to thereby control the resultant force on the tonearm.

4,170,363
OIL SCRAPER

Ulf C. Bergman, Malmo, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Filed Jul. 2, 1976, Ser. No. 702,185
Int. Cl.[2] F16J *15/18*
U.S. Cl. 277—24 3 Claims



1. A scraper ring for removing oil from an oil-coated cylindrical surface which reciprocates rectilinearly in the direction of the axis of the cylindrical surface in combination with an assembly of elements axially disposed alongside said cylindrical surface, comprising, a body formed at least in part of plastically deformable material at normal working temperatures and exhibiting a long wear characteristic to contact and motion thereagainst of said reciprocating cylindrical surface, said body formed of four co-axially disposed annular surfaces comprising an outer peripheral surface, an inner frusto-conical surface tapering away from said cylindrical surface to form an edge which constitutes the smallest diameter and is disposed at an axial extremity of the body to register against said reciprocating cylindrical surface and scrape oil therefrom, two conically-tapering surfaces joining the inner and outer surfaces with one such surface meeting said edge being wider than the other thereby to present a taper angle on the surface near said edge of the ring that permits the ring when under pressure from the opposing surface to flow plastically at said normal working temperatures in the direction toward the edge sufficiently to keep said edge in contact with said reciprocating surface under substantial wear, a retainer element contacting said ring with a surface adjacent to and substantially mating with said wider conically tapering surface, and resilient means holding said ring against said retainer element.

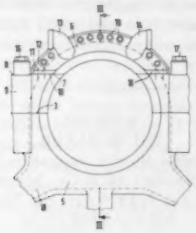
4,170,364
SHAFT SEALING SYSTEM FOR A STEAM TURBINE

Axel Remberg, and Willi Triesch, both of Mülheim, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Aug. 8, 1977, Ser. No. 822,796
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1976, 2635918
Int. Cl.[2] F01D *25/24;* F16J *15/26, 15/44*
U.S. Cl. 277—53 5 Claims

1. Shaft sealing system for a steam turbine having a horizontally divided outer housing and a shaft sealing cover disposed at an end of the outer housing comprising a shaft seal having a part thereof received in the cover, an outer and lower part of said shaft seal together with a respective part of the cover

being rigid with the outer housing, and an upper cover segment, having a parting joint in common with said lower part of



said shaft seal at the level of an upper edge of a flange for the horizontally divided outer housing, being threadedly securable to the outer housing.

4,170,365

GASKET OF RUBBER OR A SIMILAR MATERIAL

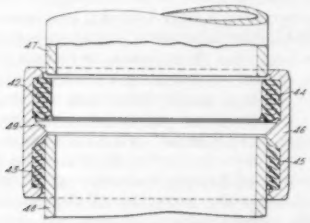
Per Haaland, Oslo, Norway, assignor to A/S Den Norske Remfabrik, Kolbotn, Norway

Filed Feb. 22, 1978, Ser. No. 883,615

Claims priority, application Norway, Feb. 25, 1977, 770644

Int. Cl.[2] F16L *49/00, 17/02;* **F16J** *15/10*

U.S. Cl. 277—207 A **10 Claims**



1. In a gasket of elastomeric material, for use in forming a seal between respective sealing surfaces of two members by relative movement of said sealing surfaces substantially parallel to each other thereby to deform the gasket, by relative displacement of portions thereof, the improvement which comprises:

(i) those portions of the gasket which are relatively displaced, during said substantially parallel movement, define at least one very narrow slit;

(ii) the distance between the opposed surfaces bounding said at least one slit is so small that, during said relative displacement, said portions are constantly in contact with each other and slide along each other over at least a part of said surfaces;

(iii) said at least one slit is so arranged that, during said substantially parallel movement in a first direction for forming said seal, said displaced portions of the gasket do not become bent, whereas any substantially parallel movement in a second direction, opposite to said first direction, causes said portions to become frictionally locked with each other, thereby to offer relatively high resistance to said parallel movement in said second direction, with production of a relatively high packing pressure between said sealing surface.

4,170,366

CHUCK

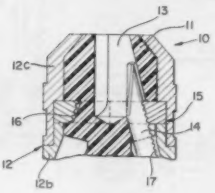
Lorenzo E. Alessio, Cairoli, Italy, assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 22, 1979, Ser. No. 880,248

Claims priority, application Italy, Mar. 14, 1977, 21180 A/77

Int. Cl.[2] B23B *31/04*

U.S. Cl. 279—62 **2 Claims**



1. A chuck for clamping a tool such as a drill bit or the like with the aid of a chuck key comprising:

a plastic hollow body defining a longitudinal axis and having a front end for receiving the tool therein;

a plurality of elongated jaws movably mounted in said hollow body for tightly engaging a tool whereby substantial radial forces are transmitted to said body by said jaws;

first thread means on said jaws;

a sleeve rotatably mounted on said body and having second thread means engaging said first thread means on said jaws to actuate said jaws to clamp and release the tool whereby substantial radial forces are transmitted to said body;

said sleeve being disposed in surrounding relation to said hollow body to laterally support said body against said radial forces, said sleeve extending in the direction of said longitudinal axis substantially the entire distance to said front end of said body whereby full lateral support is provided also at the front end portion of said hollow body;

said sleeve having an end face remote from said region of said jaws and facing away from said front end; and,

a gear formed on said end face for coacting with the chuck key to rotate said sleeve for tightening said jaws on the tool.

4,170,367

SLIDING BASE

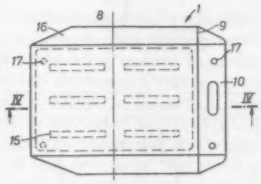
Thomas Rickenbacher, Haus Silvana, Arosa, Switzerland

Filed Jun. 5, 1978, Ser. No. 912,313

Claims priority, application Switzerland, Jun. 8, 1977, 7051/77

Int. Cl.[2] B62B *13/16*

U.S. Cl. 280—18 **3 Claims**



1. A sliding base for transporting a load over a frozen surface, said base being of the type having a handgrip and a sliding part, wherein said sliding part is improved and comprises the combination of:

an upper sheet of flexible material;

a lower sheet of flexible material spaced from said upper sheet and attached at its edges to said upper sheet;

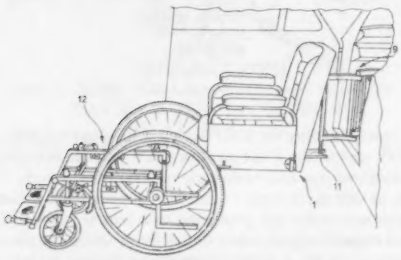
a sheet of resilient foam material sandwiched between said upper and lower sheets;
means defining a transverse hinged portion for permitting folding of said sliding part, and
a plurality of runner-like contouring inserts extending parallel to the direction of travel of said base and fastened between said sheet of foam material and the inside of said lower sheet.

4,170,368

TRANSPORTATION OF DISABLED OR INVALIDED PERSONS

Leonard B. Southward; Christopher J. Simpson, both of Paraparaumu, and Charles R. Tunbridge, Raumati Beach, all of New Zealand, assignors to Southward Engineering Co. Limited, Lower Hutt, New Zealand

Filed Nov. 21, 1977, Ser. No. 853,239
Claims priority, application New Zealand, Nov. 22, 1976, 182687
Int. Cl.[2] B60P *1/46*
U.S. Cl. 280—242 WC **19 Claims**



1. Transportation means for disabled or invalided persons comprising a collapsible wheelchair having a seating unit with a seat part and associated backrest, wheeled base parts with which the seating unit can be detachably engaged for propulsion as required, said wheeled base parts being collapsible in unitary or separable form for stowage, locking means to secure the seating unit to the wheeled base parts when engaged therewith, and said seating unit being arranged for connection to and support by a support unit fixedly mounted remote and separate from the wheeled base; said support unit mounting a movable frame comprising at least two jointed sections pivotal about a vertical axis and having an outer end part arranged for detachable engagement with the seating unit and being arranged to support and carry the seating unit with a person thereon from a first prescribed position to a second prescribed position following disengagement of the seating unit from the wheeled base parts, and being movable from the second prescribed position to the first prescribed position for reengagement of the seating unit with the wheeled base parts and detachment of the movable frame.

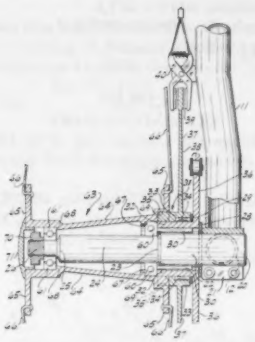
4,170,369

BICYCLE WHEEL SUSPENSION, DRIVING AND BRAKING ASSEMBLY

Warren A. Strutman, St. Louis, Mo., assignor to Lauren Strutman; Lisa Strutman and Jerome A. Gross, all of Clayton, Mo.

Filed Jan. 23, 1978, Ser. No. 871,752
Int. Cl.[2] B62M *9/02*; B62K *25/02*
U.S. Cl. 280—261 **2 Claims**

1. For bicycles and the like, a driving wheel assembly comprising
an asymmetric suspension strut,
a rigid axle mounted horizontally on the lower end of said strut and having thereon
a. a rotatable driving and braking assembly mounted adjacent to said strut and including
bearing means,
an overrunning clutch having
an inner driving ratchet mounted on said bearing means and having a drive sprocket extending radially from that end of the inner driving ratchet adjacent to such strut, said overrunning clutch further having
an outer driven portion mounted on said driving ratchet adjacent to said sprocket at its side opposite to said strut, and having a brake disc extending radially outward therefrom, said axle further having thereon
b. wheel bearing means outward of said driving and braking assembly,
c. a wheel having a hollow hub mounted on said wheel bearing means, and



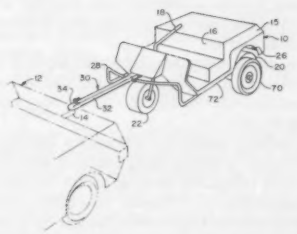
d. fastener means removably mounted at the outward end of the wheel to secure the wheel hub pressed toward said rotatable assembly and said strut,
e. the said outer driven portion of said overrunning clutch and the wheel hub portion adjacent thereto together having axially releasable means for interengagement thereof when the wheel is so pressed toward the strut, in combination with
f. caliper means positioned on said strut to engage opposite sides of said brake disc,
whereby when the wheel is so pressed it is subject to braking, and when said fastener means is removed the wheel may be removed and replaced axially without interference with the caliper means or said rotatable driving and braking assembly.

4,170,370

AUXILIARY WHEELS FOR GOLF CART

Cyril L. Schaefer, Box 33, Potosi, Wis. 53820

Filed Sep. 16, 1977, Ser. No. 833,801
Int. Cl.[2] B60S *9/22*
U.S. Cl. 280—400 **7 Claims**



1. In a detachable trailering assembly for a golf cart or the like having side frame members and a major portion of its weight on the rear drive wheels thereof, the combination of:

a pair of stub axles each being attachable to a side frame member of said golf cart adjacent to and ahead of said rear drive wheels in an extended, horizontal position:

a pair of wheel assembies each including a supporting wheel at one end and an off-set swing axle at the other end;

each of said off-set swing axles having a leg member engageable with one of said stub axles in telescoping relationship and being rotatable thereby to a lowered position to raise said golf cart from the ground upon said supporting wheel;

said offset swing axles in said lowered position being in a trailing relationship from said stub axles in an arc rearwardly toward said rear drive wheels to thereby support said major weight portion of said golf cart; and

means to lock each of said swing axles in said lowered supportive positions; and

a tow bar attachable to the front of said golf cart in a cantilever towing position

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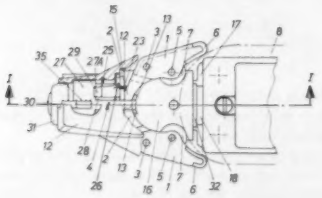
4,170,371

SKI BINDING PART

Erwin Weigl, Brunn am Gebirge, and Alois Himmetsberger, Vienna, both of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Feb. 22, 1978, Ser. No. 880,082
Claims priority, application Austria, Feb. 23, 1977, 1211/77
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—625 **17 Claims**



1. A releasable ski binding for use on a ski, comprising:

housing means secured to said ski;

first carriage means movably mounted on said housing means for movement between first and second positions along a path which extends parallel to the longitudinal axis of said ski;

a pair of ski boot engaging sole holders pivotally mounted on said first carriage means for movement about vertically extending axles and between a ski boot holding position and a ski boot releasing position, said sole holders being also movable along said path with said first carriage means;

second carriage means movably mounted on said housing means and relative to said first carriage means, said sole holders each having first means thereon engaging said second carriage means so that a movement of at least one of said sole holders about said axle therefor will effect a movement of said second carriage means relative to said first carriage means;

first resilient means extending between said first and second carriage means for resiliently biassing said second carriage means and said sole holders to said ski boot holding position thereof; and

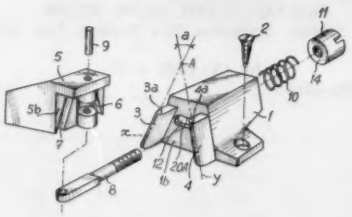
releasable locking means for releasably locking said first carriage means to said housing means in said first position thereof, said releasable locking means including control means responsive to a relative movement between said first and second carriage means caused by a turning of at least one of said sole holders about said axle therefor to effect a release of said locking relation between said housing means and said first carriage means whereby said first carriage means and said sole holders mounted thereon will move away from said first position and said ski boot under the force applied to at least one of said sole holders toward said second position.

4,170,372

DEVICES MOUNTED ON A SKI

Georges P. J. Salomon, Annecy, France, assignor to S.A. des Etablissements Francois Salmon & Fils, Annecy, France

Continuation of Ser. No. 747,526, Dec. 6, 1976, abandoned. This application Oct. 17, 1978, Ser. No. 952,132
Claims priority, application France, Dec. 11, 1975, 75 37908
Int. Cl.[2] A63C *9/085*
U.S. Cl. 280—626 **7 Claims**



1. A safety binding for a ski having a longitudinal plane of symmetry comprising a one-piece jaw in which can be engaged and maintained one end of the sole of a ski boot, a body connectible to said ski in front of said jaw, support means associated with said body and providing two lateral support lines disposed respectively on either side of the longitudinal plane of symmetry of the ski, resilient means urging the jaw against said support means at the support lines, said support means and jaw being engaged such that the jaw can pivot on either line of support, the lines of support viewed along the longitudinal axis of the ski converging towards a point disposed above the ski in order that in one direction of lateral movement of the jaw the jaw will pivot about one line of support and in the other direction of lateral movement of the jaw, the jaw will pivot about the other line of support, a threaded rod and a spring in said body and in which the jaw is articulated on the rod which is urged towards the front of the ski by said spring, said rod traversing a rear wall of the body through a hole provided therein, the hole being elongated in transverse direction, the rod being maintained vertically in its central position by the upper edge of the hole.

4,170,373

WIRE SUSPENSION ARM

Harold L. Beck, Marine City, Mich.; Robert A. Wuebker, Westerville, Ohio, and Louis J. Aure, deceased, late of Sterling Heights, Mich. (by Bertha Aure, executrix), assignors to General Signal Corporation, Stamford, Conn.

Filed Apr. 6, 1978, Ser. No. 893,845
Int. Cl.[2] B60K *17/30*
U.S. Cl. 280—666 **29 Claims**

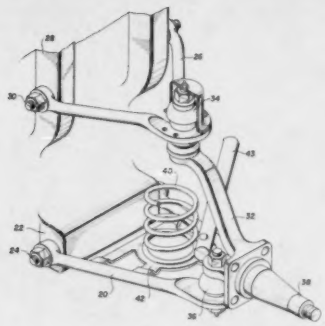
1. A suspension arm formed from a single wire comprising:

a coined U-shaped portion for receiving a ball bearing means interior the bight of said U-shape;

a first wire portion extending from one leg of said U-shaped portion at a divergent angle measured in the plane of said U-shaped portion;

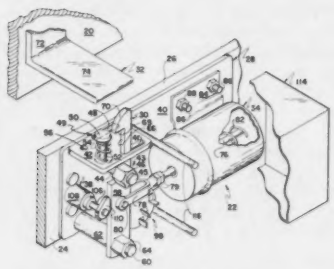
a second wire portion extending from the other leg of said U-shaped portion at a divergent angle measured in the plane of said U-shaped portion;

the axis of at least one of said wire portions being oblique to the plane of said U-shaped portion; and



a coined annulus extending from the end of each of said first and second wire portions, the planes of said annuli being parallel to each other.

4,170,374
CLOSURE LATCH
Fortunato C. Garcia, 5830 Limerick, Corpus Christi, Tex. 78413
Filed Nov. 8, 1977, Ser. No. 849,700
Int. Cl.[2] E05C *3/16*
U.S. Cl. 292—201 **8 Claims**



1. A delivery truck comprising a wheeled chassis; means for propelling the chassis along the roadway; a source of electrical power; an enclosure, of sufficient height for an adult to stand, for carrying articles and having a closure opening, a closure member and means mounting the closure member for movement in a path between positions opening and closing the opening and a power operating latching device for latching the closure member in the closed position and for unlatching the closure member, the latching device comprising

a striker mounted on the closure member for movement in the path between the open and closed position;

a framework mounted adjacent the closure opening comprising a plate member having a platform extending transversely thereto and providing a pair of generally parallel slots extending generally parallel to the plate member;

a latch pivotally mounted on the frame work for movement between the latching and unlatching positions for retaining the striker in the closed position, the latch extending through one of the slots, the other slot allowing use of the member with a differently configured latch and being biased toward the latched position and including a cam face for engaging the striker during movement thereof toward the door closed position for moving the latch toward the unlatched position and clearing the striker at the door closed position allowing the latch to move toward the latched position;

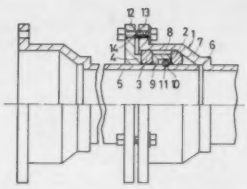
an electrically powered mechanism having an output capable of opening movement when the mechanism is energized and means drivably connecting the output to the latch for moving the latch to the unlatched position thereof upon energizing the mechanism;

an electric circuit including a normally open switch and a truck source of electrical power operative connected to the mechanism for energizing the same;

a mechanically operable unlatching device for moving the latch from the latched to the unlatched position and for moving the connecting means in the opening direction; and

means accessible from inside the enclosure for moving the latch to the unlatched position.

4,170,375
PIPE JOINT
Mitsuo Ito, 22-23 Motogo 3, Saitama-ken, Kawaguchi-shi, Japan
Filed Mar. 16, 1978, Ser. No. 887,294
Int. Cl.[2] F16L *33/20*
U.S. Cl. 285—348 **2 Claims**

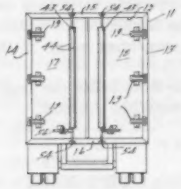


1. A pipe joint comprising a first pipe member, a joint body at one end of said first pipe member, said joint body including an outwardly inclined portion adjacent said first pipe member and a substantially constant diameter portion adjoining said inclined portion, said substantially constant diameter portion being of larger diameter than said first pipe member, a second pipe member having one end receivable in said enlarged joint body with an annular clearance between said second pipe member and said substantially constant diameter section of said joint body, a sealing assembly receivable within said clearance, said sealing assembly including first and second annular packing members, an annular sealing ring between said packing members and a counter-ring surrounding said sealing ring, the joint further including pressure applying means for applying axial pressure against said sealing assembly for pressing said assembly against said inclined portion of said joint body thereby applying inward pressure against said second pipe member wherein said second pipe member has an outer surface including a pre-formed circumferential groove receiving said sealing ring prior to the application of pressure to said sealing assembly by said pressure applying means.

4,170,376
DIMPLED DOOR HARDWARE
Tara N. Banerjea, Warren, Mich., assignor to Fruehauf Corporation, Detroit, Mich.
Filed Jul. 11, 1977, Ser. No. 814,776
Int. Cl.[2] E05C *9/08*
U.S. Cl. 292—218 **4 Claims**

1. In a trailer or like vehicle having a rear door opening defined by spaced pillars, a header and a sill, a door rotatably mounted on one of said pillars, a lock rod disposed in spaced parallel relation to the axis of rotation of the door and extending therebeyond in overlapping relation to said header and sill, means on each end of said lock rod for engaging latch means on the header and sill in vertical and horizontal stress transfer relationship, a channel shaped enclosure secured to the door in stress transfer relationship therewith and enclosing the central portion of said locking rod, and a bushing at each end of said

channel shaped enclosure for supporting said locking rod for rotation between a locked and unlocked condition, said bushing being spaced from the respective top and bottom edge of said door and said lock rod having bendable end portions between each respective bushing and latch means thereby providing respective bending moment arms, application of a



load on the inner face of the door sufficient to cause substantial bending of the end portions of the locking rod in cantilever from said bushings causing said end portions to move into engaging relationship with the respective top and bottom door edges thereby reducing the length of the bending moment arm at the end portions of the locking rod.

4,170,377

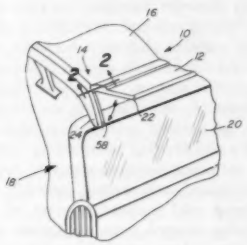
VELOCITY RESPONSIVE DEFLECTOR BLADE AND PIVOTAL MOUNTING THEREFOR

Charles E. Ingram, Warren, Mich., assignor to Four Star Corporation, Troy, Mich.

Filed Mar. 6, 1978, Ser. No. 884,009

Int. Cl.[2] B62D *37/02*

U.S. Cl. 296—1 S **29 Claims**



1. A velocity responsive deflector blade assembly, comprising:

(a) a deflector blade,

(b) a mounting assembly for each end of the blade, each assembly comprising:

(1) a blade cap, the end of the deflector blade being journalled thereonto,

(2) a casting having means defining a ledge, the blade cap normally seating on the ledge,

(3) means pivotally mounting the blade cap to the casting, and

wherein the blade cap pivotally rotates about the pivotal mounting means relative to the casting in response to the velocity of air impinging against the deflector blade, the deflector blade directing a stream of air over a portion of a vehicle when a vehicle is moving at low speeds and pivotally rotating to a position parallel to the stream of air impinging thereagainst when a vehicle is moving at high speeds to minimize the drag created by the deflector blade.

4,170,378

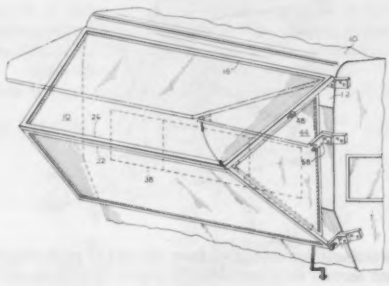
COMBINED WIND DEFLECTOR AND WINDOW AWNING ASSEMBLY FOR RECREATIONAL TRAILERS

Gerald A. Jacobsen, 13224 Ha Hana Rd., Lakeside, Calif. 92040

Filed Apr. 24, 1978, Ser. No. 898,719

Int. Cl.[2] B60J *9/04*

U.S. Cl. 296—1 S **3 Claims**



1. A combined wind deflector and window awning assembly for recreational trailers having a front end wall with a window therein, said combined deflector and awning comprising:

(a) an upper panel of isosceles trapezoidal configuration having the longer of the parallel edges thereof horizontally hinged to a top exterior portion of the front end wall of a trailer;

(b) a lower panel of similar configuration having the shorter of the parallel edges thereof hinged to the shorter of the parallel edges of said upper panel;

(c) fastening means releasibly attaching the longer of the parallel edges of the lower panel to a portion of the front wall of the trailer below said window, so that said panels, in a first position thereof define a wedge with a single horizontal apex shorter than said longer leg; and

(d) further fastening means capable of directly attaching said lower panel, at its said longer edge, to a portion of the front wall of the trailer above said window, so that said panels in a second position thereof define a self-supporting awning over said window.

4,170,379

CARRIAGE INSERTABLE INTO THE LOAD SPACE OF A MOTOR VEHICLE

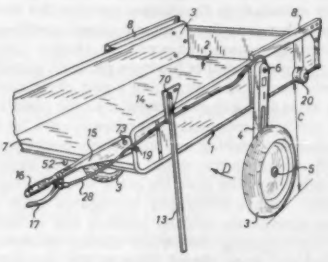
Josef Eicher, Eichholz 1108, Balgach, Switzerland (9436)

Filed Oct. 3, 1977, Ser. No. 838,446

Claims priority, application Switzerland, Oct. 7, 1976, 12738/76

Int. Cl.[2] B62H *3/02*

U.S. Cl. 296—20 **10 Claims**



1. A cart insertable into the loading space of a vehicle, comprising frame means (1) having a given width, a loading platform (2), at least two wheeels, arm means disposed at a respec-

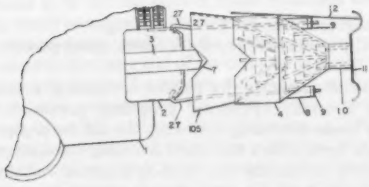
tive outer side of the frame means for tilting about a generally horizontal rotational axis (6), individual axle means (5) extending horizontally outwardly from the respective arm means (4) for securing the corresponding wheel means to a respective one of said arm means (4), whereby the arm means (4) and with the arm means the wheels (3) may be tilted into a position above the loading platform (2), roller means secured at the front portion of the vehicle to project below said loading platform, locking and release means arranged for locking the arm means in their lowered position and for releasing said arm means for upward tilting when the arm means are not loaded, said cart further comprising tiltable support means (13) arranged adjacent to the rear end of the cart for steadying the cart, strut means (15) operatively secured to said frame means (1), means for arresting said strut means in its lowered down position, said strut means being tiltable toward said platform (2) to reduce the effective length of the cart when it is inserted in said vehicle, safety means (FIG. 3) operatively connected to said arm means (4) for preventing unlocking of the lowered arm means, said safety means including locking means (30, 32) which automatically engage in said frame means when said arm means are lowered, wherein said arm means (4) are secured to the middle third of the frame means (1), and wherein the distance between the floor and said loading platform (2) corresponds to about $\frac{1}{3}$ of said given width of said frame means when the arm means are lowered.

4,170,380

ENERGY ABSORBING DEVICES TO BE USED ON VEHICLES TO PROTECT THE VEHICLE FROM DAMAGE (OR REDUCE DAMAGE) AND PROTECT THE PASSENGERS FROM FATALITY AND/OR INJURY

Eli Raitport, 1807 Mower St., Philadelphia, Pa. 19152

Filed Feb. 20, 1973, Ser. No. 334,153
Int. Cl.[2] B60N *1/08*
U.S. Cl. 296—65 A **10 Claims**



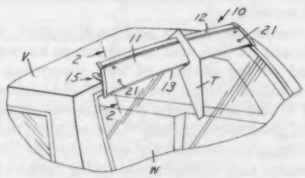
1. An energy absorbing, elastically deforming device comprising a hollow cone at one end and a hollow cup being joined to the cone at the other end, said cone having one end of a larger diameter than the other end, both capable of deforming elastically whereas the larger diameter of said cone is connected to said cup by a relief portion, and whereas said cup encircles the joint line formed by said relief portion between said cone and said cup, and whereas the outside perimeter of said cone is within the inner perimeter of said cup, and whereas the longitudinal distance between the inner walls of said cup and the outside edge of said larger diameter of said cone is relatively short when compared to the respective lengths of the cone and the cup, said joint line being substantially thinner than the walls of said cone and cup, whereby force applied to said device biases the smaller diameter of said cone to move toward said cup and the outer edges of said larger diameter of said cone to bear against the inner walls of said cup, whereby said cone and said cup are elastically compressed and stretched, respectively.

4,170,381

UNIVERSAL MOUNT WIND DEFLECTOR AND METHOD OF MOUNTING

Frederick A. Helm, 2900 E. Jefferson, Detroit, Mich. 48207

Filed Jul. 25, 1977, Ser. No. 818,514
Int. Cl.[2] B60J *1/20*
U.S. Cl. 296—91 **3 Claims**



1. A wind deflector comprising,

a wind deflector blade adapted to extend along the rear of a vehicle,

at least one base bracket adapted to be mounted on a vehicle,

at least one blade bracket adapted to be mounted on the wind deflector blade,

and adjustable means between the base bracket and blade bracket for changing the angular relationship of the wind deflector blade with respect to the vehicle,

a removable template mounted on said deflector blade and having an edge portion thereof extending in predetermined relationship along the window of the vehicle such that when the template is mounted on the deflector, the deflector can be adjusted to bring the edge portion into predetermined relation to the window of the vehicle and thereby establish the proper relationship of the deflector to the window after which the template can be removed.

4,170,382

POSTURE CHAIR

Kenneth L. Wheeler, Elkhart, Ind., assignor to Domore Office Furniture, Inc., Elkhart, Ind.

Filed Jun. 20, 1977, Ser. No. 807,907
Int. Cl.[2] A47C *7/40*
U.S. Cl. 297—306 **18 Claims**

1. In a posture chair having a seat having a supporting spindle, a back, means for allowing said back to move back and forth, and means to spring-bias said back against backward movement, the combination of a bottom member, underlying said seat, which bottom member is essentially flat throughout its length and breadth;

supporting plate means fastened to the underside of said bottom member supported by said spindle and extending over the areas of said bottom member which are to the front and rear of and on each side of said spindle;

pivot support means depending from the portion of said supporting plate which extends over the area to the rear of said spindle;

pivoted means pivoted to said pivot support means on a transverse axis which is parallel to and substantially below

said bottom member and adjacent and parallel to the rear edge thereof;

back support means having an upper portion and a lower portion, said upper portion being affixed to said back and supporting said back in position to be engaged by a person's back and said lower portion extending substantially below the bottom of said seat and being affixed to said pivoted means, thereby to permit the aforesaid back and forth motion;

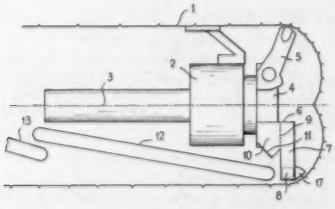
spring means for biasing said back support means against backward motion, said spring means having one end attached to the portion of said supporting plate means which extends under the area of said bottom which is in front of said spindle and the other end pivotally attached to said pivoted means below and adjacent to the bottom of said seat and substantially above and to the rear of said transverse axis, whereby said spring means extends below, adjacent to, and substantially parallel with the bottom of said seat; in which the upper portion of said back support means extends down to a position adjacent the back bottom edge of said seat and the lower portion projects underneath the seat at an obtuse angle to said upper portion, and at an acute angle to the bottom member of said seat; in which said pivoted means comprises receiving means for adjustably receiving the lower portion of said back support means operative on said acute angle to adjust the said back support means backward and upward, whereby the height of said back can be adjusted and simultaneously therewith, due to the angularity of said lower portion of said back support means, the seat depth can be proportionally adjusted; and in which said pivoted means comprises yoke means having an elongated, substantially flat portion, the bottom ends of which are pivoted in said pivot support means, the top ends of which are pivoted to said spring means, and the mid-portion of which is provided with said receiving means, said receiving means angling from a point adjacent the rear edge of the bottom member of said seat at an angle complementary to the acute angle at which the lower portion of said back support means projects underneath the bottom of said seat, in which the center line, through the point at which the spring means is pivotally connected to said yoke and the point at which said yoke is pivotally connected to said pivot means, subtends an angle of about 50 degrees to about 60 degrees with the bottom of said seat, and in which said receiving means, in the forward position of the back, forms an angle with the bottom member of said seat of between about 40 and about 50 degrees.

4,170,383

TUNNELING MACHINES AND OTHER CUTTING MACHINES

Marcel Montacie, Paris, France, assignor to Bouygues, Clamart, France

Filed Jan. 17, 1978, Ser. No. 870,215
Claims priority, application France, Jan. 21, 1977, 77 01719
Int. Cl.[2] E21D *9/00*
U.S. Cl. 299—56 **8 Claims**



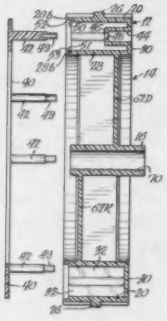
1. A cutting machine for cutting materials from a wall located in front of the machine including a movable frame having a cutting head rotatable about a fixed horizontal axis, said cutting head supporting at least one bucket adjacent the periphery thereof and rotatable about a circumferential path having a low point and a high point for picking up the material and depositing the material on a conveyor, said bucket having an inlet opening and an outlet opening axially spaced from each other with said outlet opening spaced rearwardly of said inlet opening in the direction of travel of said frame, said inlet and outlet openings having separate inlet and outlet passages leading therefrom and communication means between said passages spaced radially inwardly with respect to said axis from said inlet and outlet openings.

4,170,384

MOLDED WHEEL HAVING A DECORATIVE SIDEWALL

Jordan I. Rotheiser, Highland Park, Ill., assignor to American Wheel & Engineering Co., Inc., Arlington Heights, Ill.

Filed Sep. 29, 1977, Ser. No. 837,931
Int. Cl.[2] B60B *5/02*
U.S. Cl. 301—63 PW **17 Claims**



1. A one-piece molded wheel comprising:

a generally annular tire portion, a central spoke portion, and a hub portion;

said generally annular tire portion comprising a radially outer generally cylindrical peripheral portion having tread means extending outwardly thereof for engaging a surface upon which the wheel is rolled, a radially inner generally cylindrical rim portion disposed radially inwardly of the tire portion, and an intermediate annular portion disposed generally transversely of said peripheral and rim portions extending between corresponding axial edges thereof and formed integrally therewith, and a plurality of support members each having one end integral with said peripheral portion and its other end integral with said rim portion;

said central spoke portion comprising a plurality of spoke members, each spoke member having one end integral with said rim portion of the annular tire portion and the other end integral with said hub portion to provide support therefor;

said hub portion being substantially cylindrically shaped and defining an opening for receiving an axle of a vehicle in rotatable relationship therewith;

an annular band disposed between corresponding axial edges of said rim and said peripheral portions opposite from said annular portion; and

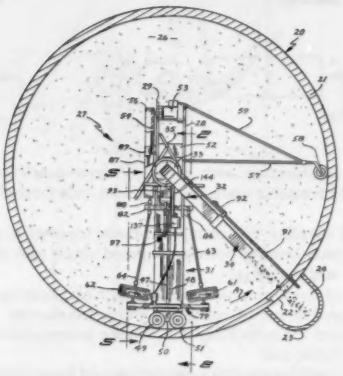
means forming part of said annular portion for securing said annular band thereto.

4,170,385

SILO UNLOADER WITH LEVELING AND DRIVE STRUCTURE

Floyd E. Buschbom, Long Lake; Glen D. Hansen, Maple Plain, and Jerome T. Paulson, Long Lake, all of Minn., assignors to Veda, Inc., Long Lake, Minn.

Filed Jan. 14, 1977, Ser. No. 759,417
Int. Cl.[2] B65G *65/38*
U.S. Cl. 406—59 60 Claims



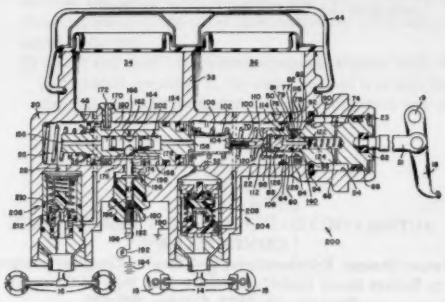
1. A drive and leveling structure and control therefor for a top unloading silo unloader including a material collector having an outer end comprising: a base adapted to be mounted on the outer end of the collector, a first support movably connected to the base for generally upward and downward movement, a first drive wheel located adjacent the forward side of the collector, a first mount connecting the first wheel to the first support, a second support movably connected to the base for generally upward and downward movement, a second drive wheel located adjacent the trailing side of the collector, a second mount connecting the second wheel to the second support, a first arm secured to the first support, a second arm secured to the second support, linear extendible and contractable means connected to the first and second arms operable to pivot the supports and hold the supports in selected positions to maintain the outer end of the collector in a selected operating position, means for rotating the first and second wheels, a control unit mounted on the collector for controlling said linear extendible and contractable means, a reference arm adapted to be held in a fixed reference position, means connecting the reference arm to the control unit whereby relative movement between the reference arm and control unit operates the control unit which causes a change in the length of the linear extendible and contractable means thereby changing the elevation of the outer end of the collector means, said control unit includes movable means connected to the means connecting the reference arm to the control unit, said movable means being selectively locatable in a center off position, an up on position, and a down on position whereby when said outer end of the collector moves to a down position below the selected operating position, the movable means moves to the up on position operating the motor in the second direction to change the effective length of said linear extendible and contractable means thereby raising the outer end of the collector to the selected operating position, and when said outer end of the collector moves to a position above the selected operating position, the movable means moves to the down on position operating the motor in the first direction to change the effective length of said linear extendible and contractable means thereby allowing the collector to move to the selected operating position.

4,170,386

CONTROL FOR A TWO STAGE MASTER CYLINDER

Paul B. Shutt, St. Joseph, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 12, 1977, Ser. No. 832,134
Int. Cl.[2] B60T *11/20, 11/08*
U.S. Cl. 303—6 C 10 Claims



1. A two stage master cylinder comprising:

a housing having a first diameter bore separated from a larger second diameter bore by a shoulder and a reservoir connected to said first diameter bore;

a first piston located in said first diameter bore and cooperating with said housing to define a first chamber in said first diameter bore;

a second piston having a first cylindrical body with a first diameter section extending from a second diameter section into said first diameter bore and cooperating with said housing and said first piston to define a second chamber in said first diameter bore, said second diameter section cooperating with said first diameter section, said shoulder, and said housing to define an actuator chamber in said second diameter bore, said first cylindrical body having a stepped axial bore extending through said first diameter section to a point adjacent said second diameter section, said first cylindrical body having a first radial passage for connecting said actuation chamber wtih said axial bore and a second radial passage for connecting said axial bore to said reservoir;

shuttle means located in said stepped axial bore of said first cylindrical body having a first surface exposed to the fluid in said second chamber and a second surface exposed to the fluid in said actuation chamber, said first surface being larger than said second surface, said shuttle means including a second cylindrical body having a first section separated from a second section by a second shoulder, said second shoulder cooperating with said stepped axial bore and the first section of said second cylindrical body to define a dampening chamber, a radial bore providing restricted fluid communication between the dampening chamber and the reservoir, the fluid pressure in said dampening chamber operating to control the rate of movement of said shuttle means;

first seal means associated with said shuttle means for controlling the communication of fluid from said stepped axial bore into said second chamber and said reservoir;

resilient means connected to said shuttle means for urging said first surface toward said second chamber; and

input means connected to said second piston and responsive to an input force for moving said first diameter section in said first diameter bore and said second diameter section in said second diameter bore to create an actuation fluid pressure in said actuation chamber and an operational fluid pressure in said second chamber, said actuation fluid pessure being communicated to said second chamber by flowing through said first radial passage into said stepped axial bore and around said first seal means, said operational fluid pressure acting on said first surface and mov-

ing said shuttle means in opposition to said resilient means and actuation fluid pressure acting on said second surface to communicate said axial bore to said reservoir and thereby relieve the actuation fluid pressure from said second bore to permit the entire input force to be communicated into said second piston means for moving said first diameter section in the first diameter bore and thereafter pressurize the fluid in the second chamber.

4,170,387

AUTOMATIC LOAD DEPENDENT BRAKE FORCE CONTROLLER

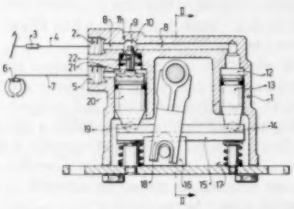
Werner Stumpe, Kornwestheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 4, 1977, Ser. No. 848,635

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655546

Int. Cl.² B60T *8/20*

U.S. Cl. 303—22 R **7 Claims**



1. A brake force controller for use in the braking system of a motor vehicle, said braking system including wheel brakes, a master cylinder and fluid conduits connecting said master cylinder and said wheel brakes; said brake force controller including a housing and two hydraulic cylinder-piston assemblies and a pressure control valve disposed downstream of said controller, the two pistons of said two cylinder-piston assemblies being coupled by a lever member which pivots on a fulcrum, said fulcrum being provided by a movable support, thereby providing changeable effective lever arms of said lever member for changing the effective relative torque exerted by said pistons, and further including a linkage for linking a motor vehicle axle to a yieldable member in said controller to thereby move said movable support, and wherein the improvement comprises:

regulator means, disposed in said controller for exerting a rotary motion force;

first and second shafts, connected to said linkage, and so disposed coaxially that said yieldable member exerts a torque on said first shaft which is less than the torque normally applied by said linkage when intact, thereby having no effect on the displacement of said first shaft, and when said linkage is broken, said yieldable member exerts a torque on said second shaft which is greater than the maximum torque sustainable by said regulator means, and when the first shaft is further rotated when the linkage breaks, said yieldable member readjusts the movable support in the direction of a medial position; and the movable support is a slide which is disposed to move in said housing and which is urged to so move by said first shaft via said yieldable member which is a torque-limiting rotary coupling, and wherein said second shaft is positively coupled to said slide.

4,170,388

PIVOTALLY MOUNTED BEARING HOUSING IN WHICH TWO TURBO-MACHINE SHAFTS ARE RIGIDLY COUPLED

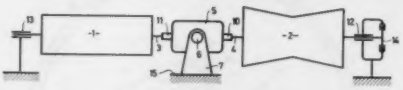
John P. Naegeli, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 1, 1977, Ser. No. 856,511

Claims priority, application Switzerland, Dec. 3, 1976, 15242/76

Int. Cl.² F16C *35/00*

U.S. Cl. 308—15 **10 Claims**



1. In combination with a pair of turbo-machines having respective rotatable shafts disposed with ends thereof in facing relation;

a solid coupling connecting said shafts together at said ends;

a common bearing housing disposed about said shaft ends and said coupling;

a pair of bearings in said housing, each said bearing having a respective one of said shafts journalled therein;

a pedestal for supporting said housing independently of said machines; and

a pivot bearing pivotally supporting said bearing housing on said pedestal, said pivot bearing having a horizontal axis perpendicular to said shafts.

4,170,389

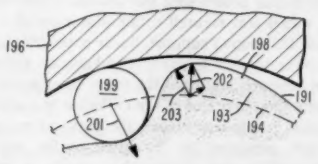
FOIL BEARING

Abraham Eshel, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 21, 1977, Ser. No. 835,275

Int. Cl.² F16C *17/08*

U.S. Cl. 308—160 **30 Claims**



1. A bearing structure for cushioning the movement of an element, comprising:

bearing means including a resiliently stretchable and imperforate foil member positioned with at least a portion of said means extending across the path of said element; and

means for supplying a lubricant between said foil and said element for spacing said foil and element apart for a predetermined dimension;

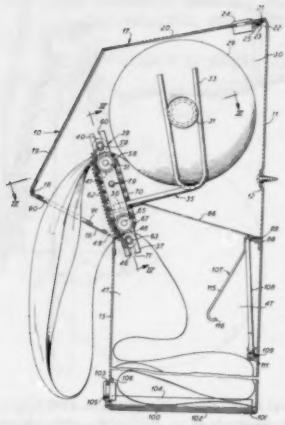
said bearing means also including means for pressurizing said foil on the side thereof opposite said element, so as to establish a normal operating pressure differential characterized by a higher pressure on the side of said foil opposite said element and a lower pressure on the side of said foil confronting said element, thereby resiliently stretching said foil bulgingly toward said element, and said foil being sufficiently thin that upon the localized introduction of any foreign body of dimension greater than said predetermined dimension between said element and said foil, said foil is displaced locally around said body in a plurality of different directions at least some of which have components opposite to the directions of motions of said body and said element.

4,170,390

PAPER TOWEL DISPENSER

Stanley G. McCabe, 4602 50th, #156, Lubbock, Tex. 79414

Filed Mar. 9, 1978, Ser. No. 884,901
Int. Cl.[2] B65H *19/00*
U.S. Cl. 312—37 **12 Claims**



1. A dispenser for paper toweling of a type difficult to tear, comprising:

a cabinet having an upper clean towel compartment and a lower spent towel compartment,

a roll of paper toweling in said clean towel compartment,

means removably supporting said roll of paper toweling in said clean towel compartment adjacent the top thereof,

towel supply means in said clean towel compartment,

a downwardly opening dispensing passageway from said clean towel compartment disposed beneath said towel supply means,

means isolating said clean towel compartment from said spent towel compartment,

a slot leading into said spent towel compartment to accommodate the return of spent toweling thereinto,

towel return means in said spent towel compartment, returning the spent toweling as the clean toweling is withdrawn from said clean towel compartment,

drive means driven from said towel supply means for driving said towel return means,

said means removably supporting said roll of paper toweling in said clean towel compartment comprising a pair of spaced upwardly opening yokes spaced apart a distance slightly greater than the width of the toweling,

means connecting said yokes together at their lower ends,

the roll of paper toweling having a tube extending along the interior portion thereof about which the paper toweling is wound, and

plugs slidably guided in said yokes and extending within opposite ends of said tube and having positive connection therewith to accommodate clean toweling to be retained for rotation within said clean towel compartment and to be drawn from said clean towel compartment.

4,170,391

REFRIGERATOR CABINET CONSTRUCTION

Bernard J. Bottger, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 21, 1978, Ser. No. 945,678
Int. Cl.[2] F25D *11/00;* **E06B** *3/70*
U.S. Cl. 312—214 **8 Claims**

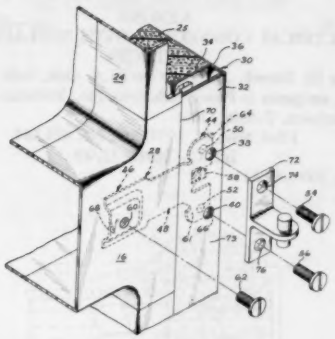
1. A support arrangement in a refrigerator having a hinged door to attach a hinge pin assembly to the outer case and to secure the outer case to a mullion comprising;

(a) the case having a U-shaped portion including an outer leg and an inner leg spaced from the outer leg and a center portion joining the two legs, the outer leg having two spaced openings and the inner leg having a slot between the outer leg openings,

(b) the mullion having an edge abutting the edge of the outer leg of the case and an opening,

(c) a cross piece support member spanning an area of the mullion and outer case abutment and inserted in the U-shaped portion of the outer case, said cross piece support member having,

(i) a first end with two spaced openings aligned with the two spaced openings in the outer leg and a detent tang dimensioned and located to snap into the inner leg slot



to thereby retain the cross piece support member in its proper position relative to the openings,

(ii) a second end having an opening in alignment with the mullion opening and a fastener element through both openings to secure the cross piece support member to the mullion, and

(iii) a central portion connecting the first and second ends,

(d) a hinge pin assembly abutting the outer case, and

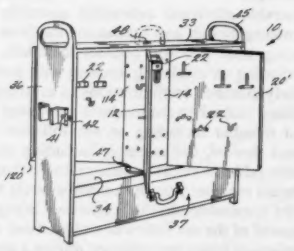
(e) fastener elements for securing the hinge pin assembly, case and cross piece support member together passing through the two openings in the outer leg of the case and into the openings of the first end of the cross piece support member.

4,170,392

ARTICLE SUPPORTING ARRANGEMENT

Stephen T. Spevak, Takoma Park, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed May 18, 1978, Ser. No. 907,321
Int. Cl.[2] A47B *97/00, 81/00*
U.S. Cl. 312—283 **19 Claims**



1. An article supporting assembly comprising

a center plate,

at least two spanners, each having first and second opposite

edges, each of the first and second edges of each spanner parallel to but spaced from the other,

at least two cover plates,

article supporting means formed on at least one of said center plate and said cover plates, and

means for hinging each of said spanners to said center plate generally along said spanner first edges, and means for hinging said cover plates together, and means for hinging a said cover plate to each of said spanners generally along said second edge of each of said spanners, so that said cover plates are pivotal from a first position generally parallel to said center plate to a second position generally perpendicular to said center plate.

4,170,393

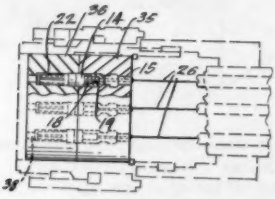
ELECTRICAL CONNECTOR WITH REPLACEABLE CONTACTS

Aloysius M. Mocek, Jr., and George A. Oak, both of Toledo, Ohio, assignors to Power Industries Inc., Division of Groman Corporation, Toledo, Ohio

Filed Nov. 14, 1977, Ser. No. 851,161

Int. Cl.[2] H01R *13/42*

U.S. Cl. 339—63 M **12 Claims**



1. An electrical connector comprising a housing of rigid protective material having an open face portion, a yieldable matrix material protectively contained within said housing, a plurality of current carrying contact members extending partially within and extending from said matrix material comprising active electrical contact portions accessible at said face portion, and corresponding base portions supported at least in part in and by said elastomeric matrix material and projecting slightly from said matrix material and on which said active contact portions are threadably secured.

4,170,394

HIGH VOLTAGE SEPARABLE CONNECTOR SYSTEM WITH MODIFIED DWELL POSITION

Gerard V. Conway, Pittsfield, Mass., assignor to General Electric Company, Philadelphia, Pa.

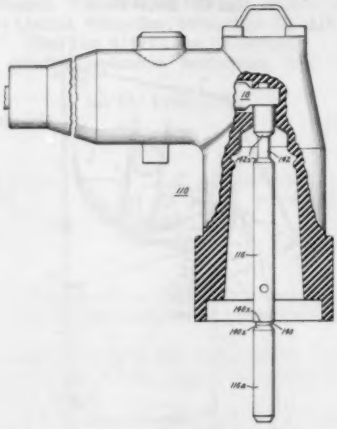
Filed Sep. 14, 1977, Ser. No. 833,329

Int. Cl.[2] H01R *13/52*

U.S. Cl. 339—111 **17 Claims**

1. A separable electrical connector assembly of the type including mating switch and connector modules respectively having mating bore and rod contact members, each of the modules including an insulating housing with portions thereof having closely matched configurations so as to form a substantially insulating seal when the modules are mated together, the rod contact member including an arc follower at a contact engaging end thereof, the assembly including means for providing a noticeable physical resistance to further insertion of the rod contact member into the switch module beyond a first insertion, the noticeable physical resistance being provided by the engagement of the arc follower and the bore contact member, this resistance being encountered during a make operation in a dwell position of the rod connector module immediately following which electrical engagement of the rod and bore contact members is made, wherein the improvement comprises:

means for providing a modified dwell position at which said arc follower is separated by a predetermined distance from said bore contact member and at which further insertion of said rod contact member into said switch



module is met by a noticeable physical resistance which is substantially equivalent to said noticeable physical resistance.

4,170,395

CONTACT FOR THE BASE PORTIONS OF LOW VOLTAGE-HEAVY DUTY SAFETY FUSES

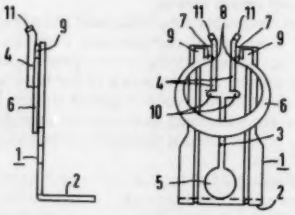
Heinz Sommerfeldt, Erlangen, and Karl Kuklies, Duisburg-Hamborn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 29, 1978, Ser. No. 920,553

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729854

Int. Cl.[2] H01R *13/16*

U.S. Cl. 339—259 F **2 Claims**

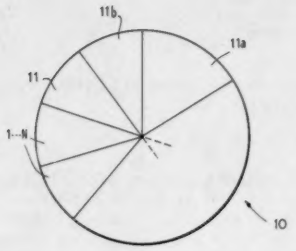


1. In a contact for the base portions of low voltage-heavy duty safety fuses and for the receipt of blade contacts thereof; and a compression spring for supporting said contact; the improvement comprising: said contact having the configuration of a planar strip having one end angled to one side thereof to form the base of an L shape and having a non-angled leg portion lengthier than said base; a longitudinal slit being formed in said non-angled leg portion of the strip, said strip being flanged at its edge extending along said slit, the inwardly located slit end being expanded to form a circularly-shaped aperture; said compression spring being omega-shaped and having ends engaging in recesses arranged in the flanged region of said strip, and said spring including outwardly extending lugs proximate its ends in its plane of extension.

4,170,396
OPTICAL COMPONENT ELEMENT

Heinz-Peter Kraft, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 676,465, Apr. 13, 1976, abandoned.
This application Feb. 24, 1978, Ser. No. 881,025
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1975, 2516236
Int. Cl.[2] G02B 5/32; G03H 1/30
U.S. Cl. 350—3.70 9 Claims

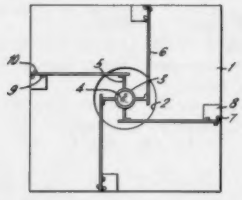


1. An optical component element for an optical material processing system, which uses a laser beam to provide heat, said component element being a circular member and dividing a single laser beam of spatially coherent radiation into a plurality of different partial beams, said component element comprising a carrier member, and a plurality of different sub-holograms formed thereon, each of said sub-holograms being a sector of a circle with the sectors filling the area of the circular member, each of said sub-holograms being constructed to produce one of the different partial beams with each partial beam exhibiting a specific spatial configuration at a specific location in space with the location of each partial beam being spaced from the locations of the other partial beams, at least one sub-hologram having a sector with a different area than the other sectors so that as the coherent radiation of the single laser beam is projected through the plurality of sub-holograms a plurality of partial beams are created to apply heat to each of the specific locations with the partial beams associated with said one sub-hologram having a different energy content.

4,170,397
VIBRATILE OPTICAL BORESIGHT

Stephen C. L. Botcherby, Dorking, and Jeremy A. Fitzherbert, Shepperton, both of England, assignors to Decca Limited, London, England

Filed Dec. 12, 1977, Ser. No. 859,967
Claims priority, application United Kingdom, Dec. 16, 1976, 52654/76
Int. Cl.[2] G02B 27/17
U.S. Cl. 350—6.3 9 Claims

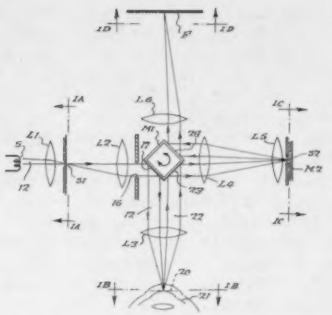


1. A vibratile optical boresight comprising an optical objective having an optical axis; means for causing vibration of said objective in a plane wholly normal to said axis, said means comprising a plurality of piezo-electric cantilevers each having a free end adjacent the objective and a fixed end remote from the said objective, the cantilevers being disposed to flex in a said plane to which the said axis is normal, said cantilevers extending in said plane away from said objective in angularly spaced directions offset from said optical axis; and means for mounting the said objective to the free ends of the cantilevers.

4,170,398
SCANNING MICROSCOPIC APPARATUS WITH THREE SYNCHRONOUSLY ROTATING REFLECTING SURFACES

Charles J. Koester, 60 Kent Rd., Glen Rock, N.J. 07452

Filed May 3, 1978, Ser. No. 902,277
Int. Cl.[2] G02B 27/17; A61B 3/14
U.S. Cl. 350—6.8 35 Claims

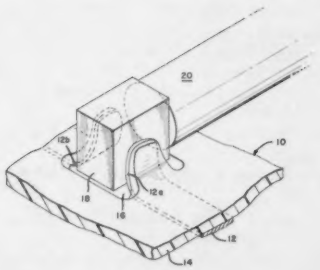


1. A scanning optical system for producing an image of an object including a light source, means for directing illumination light from said source to said object including a rotatable first mirror surface, a second mirror surface which is rotatable synchronously with said first mirror surface and which is adapted to reflect light emanating from said object, means to focus said light from said object at an aperture and means for directing the light from said aperture to a final image plane, said means including reflection from a third mirror surface rotatable synchronously with said first mirror surface and including means for imaging said aperture on said final image plane.

4,170,399
LED FIBER OPTIC CONNECTOR

Niels J. Hansen, and William Hintze, both of Camp Hill, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 668,882, Mar. 22, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,745
Int. Cl.[2] G01B 5/14
U.S. Cl. 350—96.20 2 Claims



1. In a bonded optical connection of an optical and flexible

waveguide and an edge emitting, chip form light emitting diode (LED), together with electrical connection means for the LED, the improvement consisting of:

said LED including a leading edge and an opposed trailing edge,

said LED further including a pair of conductive surfaces and an emitting edge, each of which extend from said leading edge to said trailing edge,

said electrical connection means includes a flexible insulative substrate having a first surface and a second surface separated by the thickness of said substrate,

an H-shaped slot provided through said substrate providing a pair of opposed segments of said substrate wherein each of said segments is bonded on three sides by said slot,

a layer of conductive material provided on said substrate second surface and at least partially covering each of said segments, thereby providing an electrical circuit along said segments which is interrupted by said slot,

said LED being mounted in said slot with said leading edge thereof projecting outwardly of said substrate first surface and with said trailing edge disposed within said slot and positioned in a range either between said substrate first and second surface or flush with either said substrate first and second surfaces,

said conductive material layer on said segments engaging corresponding LED conductive surfaces,

said substrate segments being resiliently deflected by said LED outwardly of the plane of the remainder of said substrate and said segments resiliently biasing said conductive material layer into engagement with said LED conductive surfaces,

said optical waveguide having an end abutting said LED emitting edge,

said optical waveguide having an end portion immediately adjacent said end thereof mounted against said substrate first surface, and

a single quantity of light transmitting encapsulant material bonding to said optical waveguide and said LED emitting edge to form an optical junction,

said light transmitting encapsulant material also bonding to said LED and said conductive metal layer to secure said LED mechanically as well as electrically to said conductive metal layer,

said light transmitting encapsulant material also bonding to said LED and said substrate segments and the remainder of said substrate and said end portion of said optical waveguide to form an integral unit of low profile projecting outwardly of only said substrate first surface without interfering with the flexibility of either said substrate or said waveguide.

4,170,400

WIDE ANGLE VIEW OPTICAL SYSTEM

Bert Bach, 270 West End Ave., New York, N.Y. 10023, and Eliot S. Gerber, 7 Frog Rock Rd., Armonk, N.Y. 10504

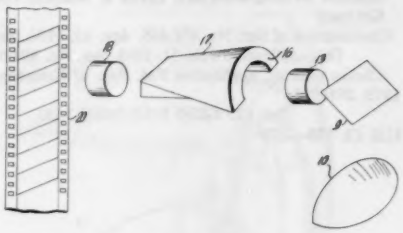
Filed Jul. 5, 1977, Ser. No. 812,493
Int. Cl.[2] G02B *5/17*; G03B *21/00*
U.S. Cl. 350—96.25 **17 Claims**

1. A camera optical system for filing a wide-angle view comprising:

a reflective convex mirror means in which a wide angle view is reflected;

a first focusing lens means to focus the image from said curved mirror means;

a fiber optic bundle consisting of a plurality of fiber optic strands to conduit a coherent image, said fiber optic bundle having a front face toward said first focusing lens in the end face shape in cross-section taken perpendicular to the axis of the fiber strands of an annulus sector and a back face in the end face shape substantially of a rectangle; and



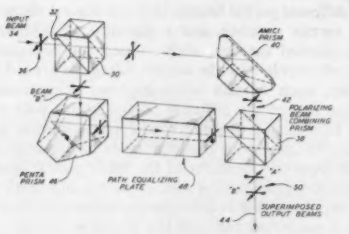
a second focusing lens means to focus the image from said optic bundle back face.

4,170,401

PASSIVE ERROR COMPENSATING DEVICE FOR OPTICAL ALIGNMENT

Paul R. Yoder, Jr.; Eugene R. Schlesinger, both of Wilton, and Robert Crane, Jr., Westport, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 15, 1977, Ser. No. 824,529
Int. Cl.[2] G02B *27/14*; G01C *1/00*
U.S. Cl. 350—173 **15 Claims**



1. A passive compensator for compensating for angular and translational misalignment of a polarized beam comprising, in combination:

a polarizing beam splitter for splitting the beam into two components of substantially equal intensity;

optical orienting means disposed in the path of at least one said component to rotate the wavefront of at least one said component relative to the other said component about two orthogonal axes; and

a polarizing beam combiner for combining said components so that the net rotation of the wavefront of the components with respect to each other by said splitter, said orienting means and said combiner is substantially 180° about each of said two orthogonal axes.

4,170,402

VERY COMPACT WIDE-ANGLE ZOOM LENS SYSTEM

Jihei Nakagawa, Murayama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

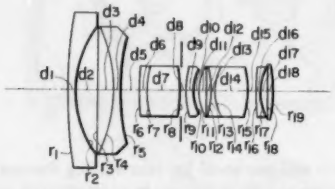
Filed Feb. 23, 1978, Ser. No. 880,494
Claims priority, application Japan, Feb. 23, 1977, 52-18147
Int. Cl.[2] G02B *15/14*
U.S. Cl. 350—184 **8 Claims**

1. A compact wide-angle zoom lens system comprising a first lens group comprising a negative meniscus lens element having a concave surface of the object side and a lens component having negative refractive power, a second lens group comprising a positive cemented doublet lens component and a negative meniscus lens element having a convex surface on the object side and a third lens group comprising at least a positive

meniscus lens element having a convex surface on the object side and a cemented doublet lens component, and said lens system being so designed as to change its focal length by displacing said first, second and third lens groups respectively and, in addition, to meet the following conditions:

$$1.5f<|f_1|<2f,\ f_1<0 \quad (1)$$

$$12f<f_2<15f \quad (2)$$



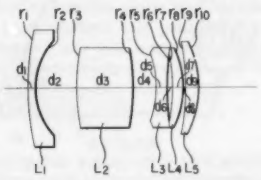
$$0.55f<D_2<f \quad (3)$$

wherein the reference symbols f represents the focal length of the entire lens system as a whole at its wide position, the reference symbols f_1 and f_2 designate the focal lengths of the first and second lens group respectively and the reference symbol D_2 denotes the total length of the second lens group.

4,170,403
RETRO FOCUS TYPE WIDE ANGLE LENS

Toshiko Shimokura, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1977, Ser. No. 848,016
Claims priority, application Japan, Nov. 9, 1976, 51-134561
Int. Cl.² G02B *9/60*
U.S. Cl. 350—216 **1 Claim**



1. A retro-focus type wide angle lens comprising, as viewed from the object side,

a first group consisting of a single negative meniscus lens L1 with its convex surface directed to the object side,

a second group consisting of a single biconvex lens L2,

a third group consisting of a single biconcave lens L3, and

a fourth and a fifth groups each of which consists of a single positive meniscus lens with its concave surface directed to the object side, wherein the following requirements should be satisfied:

$$1.69<(n_4+n_5)/2<1.72 \quad (1)$$

where n_4 and n_5 are refraction indexes of the glass materials of lenses L4 and L5 respectively with respect to line d,

$$0.06f<d_5<0.08f \quad (2)$$

where f denotes a composite focal length of the system as a whole while d_5 denotes thickness of lens L3 as measured along its axis,

$$0.14f<d_4<0.18f \text{ and} \quad (3)$$

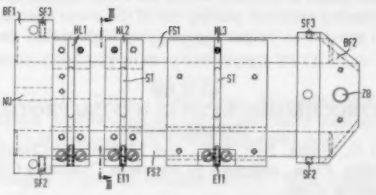
$$0.20f<d_3<0.34f \quad (4)$$

where d_4 represents distance between lenses L2 and L3 as measured along their axis and d_3 represents thickness of lens L2 as measured along its axis.

4,170,404
MOUNTING STRUCTURE FOR OPTICAL ASSEMBLIES IN NONMECHANICAL PRINTERS

Wolfgang Meye, Neuried, and Ludwig Schmidt, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 16, 1977, Ser. No. 851,941
Claims priority, application Fed. Rep. of Germany, May 9, 1977, 2720790
Int. Cl.² G02B *7/00*
U.S. Cl. 350—252 **16 Claims**



1. An optical element support assembly for electrostatic copiers for attaching optical elements to the frame of the copier with the elements in proper alignment to act upon a light beam, comprising: an optical unit including a pair of parallel guide rails having opposite end portions adjustably and fixedly attached to attachment plates, means for mounting a plurality of optical elements to the rails and cooperating mating projections and openings on the attachment plates and frame associated portions of the copier whereby the unit can be quickly and properly positioned in the copier, at least one of the guide rails being circular in cross-section, the means for mounting including mounting members, at least some of the optical elements mounted on the mounting members, the mounting members being attached to the rails and rotatable about the said one rail, the mounting members being movable axially of the rails, the mounting members having abutment portion spaced from the one rail, the abutment portion contacting a second of the rails, spring means biasing the abutment portion into contact with the second rail.

4,170,405
RESONATOR HAVING COUPLED CAVITIES WITH INTERCAVITY BEAM EXPANSION ELEMENTS

Edward A. Sziklas, N. Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 4, 1977, Ser. No. 848,697
Int. Cl.² H01S *3/05*
U.S. Cl. 350—299 **15 Claims**

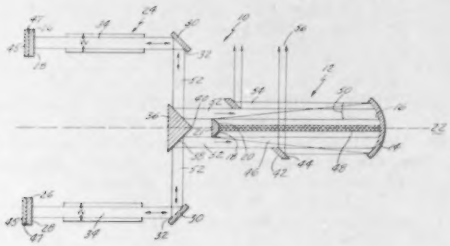
1. A resonator having coupled cavities comprising:

a mode control cavity defined at one end by a first mirror and at the other end by a second mirror wherein the first and second mirrors are positioned on and symmetrically about a centerline axis;

a power extraction cavity defined at one end by a first reflector having a flat reflective surface and at the other end by a first conical mirror having an interior reflective surface wherein the first reflector and the first conical mirror are positioned on and symmetrically about the centerline axis;

means for optically coupling the mode control cavity and the power extraction cavity wherein said means is adapted to cooperate with the first conical mirror to vary the

cross-sectional dimensions of radiation passing between the mode control cavity and the power extraction cavity; and



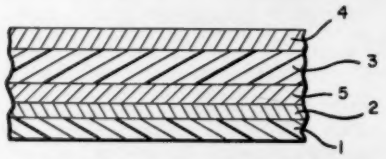
means within the mode control cavity for coupling radiation from the resonator to provide an output beam wherein said means is disposed within the mode control cavity for coupling radiation passing out of the mode control cavity to provide an output beam having high optical quality.

4,170,406

ELECTROCHROMIC DEVICES HAVING PROTECTIVE INTERLAYERS

Robert D. Giglia, Rye, N.Y., and Richard H. Clasen, West Redding, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 14, 1977, Ser. No. 851,071
Int. Cl.[2] G02F 1/17
U.S. Cl. 350—357 **4 Claims**



1. An electrochromic device comprising an electrode having an electrically conductive surface, a layer of persistent electrochromic compound in contact on one of its sides with said conductive surface of said electrode, and on its opposite side with a layer of a non-electrochromic compound having the same composition as said electrochromic compound except being more highly oxidized hence non-electrochromic, said non-electrochromic layer being in contact on its opposite side with a current carrier permeable insulator layer which on its opposite side is in contact with a counter electrode layer and means for selectively applying electrical fields of opposite polarity across said electrodes.

4,170,407

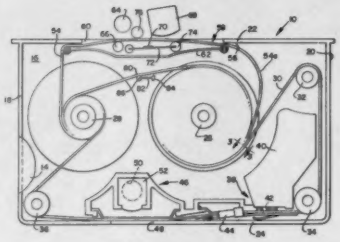
SOUND FILM CASSETTE EMPLOYING SEPARATING WEB

Joseph A. Stella, Peabody, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 2, 1978, Ser. No. 947,769
Int. Cl.[2] G03B 23/02
U.S. Cl. 352—72 **14 Claims**

1. In a photographic film cassette containing a film strip coupled at opposite ends to respective spools upon which the strip may be alternately wound and unwound for passage of the strip along a first path, said film strip including an emulsion surface on one side thereof, the cassette further including an audio tape coupled at one end to at least one of said spools for interwinding thereon with the film strip and extending along a second path including an audio station, the improvement comprising:

a separating web of thin flexible material having one end



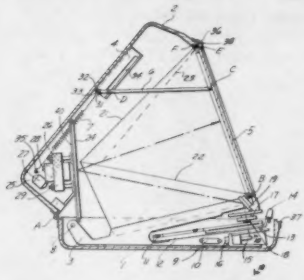
coupled to said one spool for interwinding thereon with the film strip and the audio tape in an interleaved manner interposed between the audio tape and said emulsion surface of said one side of the film strip.

4,170,408

MICROFILM VIEWER

Karl-Günther Behr, Biebertal, Fed. Rep. of Germany, assignor to Minox GmbH, Lahn-Gieben, Fed. Rep. of Germany

Filed Apr. 13, 1978, Ser. No. 895,966
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737254
Int. Cl.[2] G03B 21/30
U.S. Cl. 353—72 **12 Claims**



1. A collapsible viewing device for viewing microfilm comprising: a carrying case having a bottom part and a lid, a first hinge pivotably connecting said bottom part and said lid for opening and closing the case; a frame defining an image gate, said frame being fastened to the bottom part of the case; a viewing screen, a second hinge pivotally connecting said viewing screen to the frame; a source of electric light mounted within the case; mirrors for deflecting light beams generated by said source of light upon the viewing screen; a pivotal support means fastened to the lid of the case; a lever pivotally attached at one end to said support means, and a third hinge pivotally connecting the other end of said lever to said viewing screen, said lid being pivotable about said first hinge with respect to said bottom part, upon opening of the case, to produce relative pivotable movement of said lever about said third hinge and relative pivotable movement of said viewing screen about said second hinge until said lid reaches an operative position in which said lid bears against said viewing screen at that end thereof remote from said second hinge to form a stable assembly constituted by said frame, said first and second hinges and said lid bearing on said viewing screen, said lever constituting a connecting linkage between said lid and said screen in said operative position.

4,170,409
STILL PROJECTOR WITH COVER

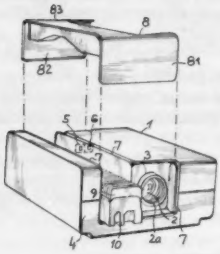
Reinhard Sobotta, and Dieter Mankau, both of Brunswick, Fed. Rep. of Germany, assignors to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,155

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 7628239

Int. Cl.[2] G03B *21/14*

U.S. Cl. 353—119 **3 Claims**



1. A still projector having a housing, a projection lens extending slightly outward from an aperture in said housing, a magazine guide parallel with said projection lens and formed in an open channel in said housing, and at least one manual switch for an electrical system of said projector, said projector comprising a cover, said cover being shaped to enclose said projection lens, said magazine guide channel and said switch, said housing having a recess shaped to receive the perimeter of said cover, said cover being shaped to fit in said recess and be retained on said projector, said cover being manually insertable into and removable from said recess, said cover having a first plate covering said projection lens and one end of said magazine guide channel, and having a second plate opposite said first plate and covering the other end of said magazine guide channel and said switch, and having a panel extending between said first and second plates and covering the top of said magazine guide channel, said panel having a projection extending downward into said magazine guide channel and shaped to be positioned closely above the upper edges of slides in a magazine in said magazine guide.

4,170,410
LIGHT MEASURING DEVICES FOR CAMERAS WITH AUTOMATIC EXPOSURE CONTROL

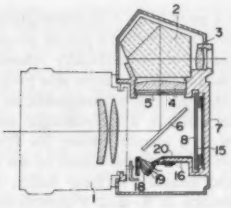
Minoru Sekida, and Kazuo Kimura, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 15, 1977, Ser. No. 768,732

Claims priority, application Japan, Feb. 27, 1976, 51-21487; Jul. 26, 1976, 51-99917[U]

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—23 R **15 Claims**



1. In a camera with automatic exposure control, including an objective lens, a camera body with film loaded at the focal plane of said objective lens, and a focal plane shutter having a leading shutter member and a trailing shutter member controlling the light reaching said film, a light measuring device for automatic exposure control, comprising:

light reflecting optical means facing a predetermined area of said focal plane to reflect light passing through said objective lens and reflected at a surface of said leading shutter member and/or a surface of said film, said light reflecting optical means including a transparent block having a light incident surface facing said predetermined area of said focal plane to receive the light reflected by the surface of said leading shutter member and/or the surface of said film, a light reflecting surface for reflecting the light passing through said light incident surface, and a light exit surface from which the light reflected by said light reflecting surface emerges; and

light responsive means facing said light exit surface of said transparent block to receive the light reflected by said light reflecting surface for generating an output for automatic exposure control, said light reflecting optical means and said light responsive means being disposed outside the light path from said objective lens to said focal plane.

4,170,411
CONTROL CIRCUIT FOR A MEMORY TYPE ELECTRIC SHUTTER

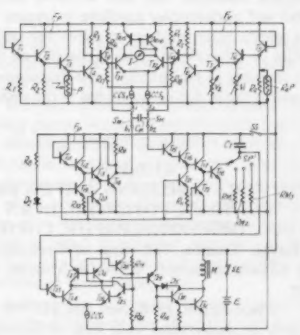
Tatsuya Taguchi, Tokyo; Yukio Iura, Kawasaki; Yoshiyuki Takishima, Machida, all of Japan, and David Fullagar, Los Altos, Calif., assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 548,620, Feb. 10, 1975, abandoned, which is a continuation of Ser. No. 269,465, Jul. 6, 1972, abandoned, which is a continuation of Ser. No. 107,637, Jan. 19, 1971, abandoned. This application Dec. 17, 1976, Ser. No. 751,947

Claims priority, application Japan, Jan. 23, 1970, 45-6146; Mar. 19, 1970, 45-23942; May 21, 1970, 45-43511

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—24 **45 Claims**

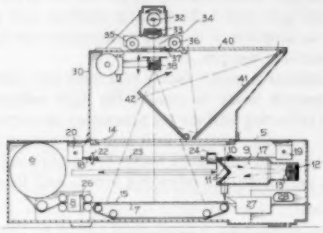


1. An electronic exposure detector comprising a logarithmic compression circuit having a plurality of linear semiconductive active elements, each output element having an output terminal, said compression circuit including an input stage having one of said elements and an output stage having one of said elements, said active element in said input stage having an input terminal and said active element in said output stage having the output terminal, a feedback circuit which is a direct conductive connection having no logarithmic means disposed between the output terminal of the active element in the output stage and the input terminal of the active element in the input stage, a photoelectric transducer connected to the output terminal of one of the active elements; and control circuit means connected to the output terminal of the compression circuit for controlling the exposure based on the output from the compression circuit.

4,170,412
MICROFILM ADAPTION UNIT FOR PHOTOCOPIER MACHINES

Archie R. Grace, 115 Avenue Rd., Clarence Gardens, South Australia, and Robert J. Grace, 167 Churchill Rd., Prospect, South Australia, both of Australia

Filed Apr. 7, 1978, Ser. No. 894,388
Claims priority, application Australia, Apr. 20, 1977, PC9821
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—5 **9 Claims**



1. A microfilm or microfiche adaption unit for a photocopier machine, said machine normally including a light to illumine a transparent window and a lens to project an image from an object placed on the said window on to a charged photoconductive member to light modify the photoconductive member and to subsequently develop the image so produced on the photoconductive member said adaption unit comprising a housing adapted to engage the photocopier machine over the transparent window of the photocopier machine, a light source and a lens supported on said housing to project light through said window, a carrier for a microfilm or microfiche on said housing between said light source and said lens to project an image from the said microfilm or microfiche through said window, means to render the said light in the photocopier machine which illumines the said window ineffective, and means in the said photocopier machine to bypass the said lens within said photocopier machine to allow the said image from the microfilm or microfiche to be projected on to the photoconductive member in said photocopier machine and to subsequently develop the image so produced in the said photocopier machine.

4,170,413
DEVICE FOR STABILIZING AND INCREASING CONTRAST POTENTIAL IN AN ELECTROPHOTOGRAPHIC COPIER

Eberhard Bayer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

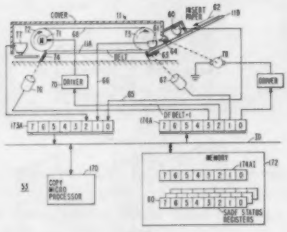
Filed Jun. 8, 1978, Ser. No. 913,700
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1977, 2726805
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 R **6 Claims**

1. A device in an electrophotographic copier, said device comprising: extinguishing means for a recorded, electrostatic charge image; said extinguishing means including light source means having a spectral distribution; said spectral distribution comprising a first spectral range of maximum photoconductivity centered about a first wavelength and having a radiation energy which is 3 to 10 times a radiation energy present in a second spectral range determined by a maximum of a product of photoconductivity production and penetration depth and being centered about a second wavelength; a width of the first and second spectral ranges being approximately ±10% of the respective first and second wavelength; and an additional radiation energy distribution in remaining portions of the spectral distribution having a radiation energy not exceeding 5 to 10% of the radiation energy of the first range.

4,170,414
DOCUMENT FEED CONTROLS FOR COPY PRODUCTION MACHINES

Wallace L. Hubert, Broomfield, and Thomas T. Underhill, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,775
Int. Cl.[2] G03G *15/00*; B65H *7/02*
U.S. Cl. 355—14 **9 Claims**

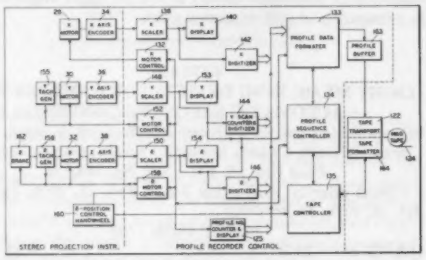


1. The combination comprising:
transport means for moving an object along a given path;
a plurality of sensing means disposed at different positions in the vicinity of said given path for producing signals indicative of the position of said object; and
sequence detection means responsive to said plurality of sensing means for producing indications of the direction of movement of said objects along the given path.

4,170,415
SYSTEM FOR PRODUCING ORTHOPHOTOGRAPHS

George P. Lemeshewsky; Thomas O. Dando, both of Alexandria; Arthur R. Shope, Jr., Reston, and Kenneth D. Kuck, Arlington, all of Va., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jul. 15, 1977, Ser. No. 816,058
Int. Cl.[2] G03B *27/32*
U.S. Cl. 355—22 **10 Claims**



1. A system for producing orthophotographs, comprising:
a recording device including a pair of projectors adapted to project a pair of stereoscopically related transparencies; an imaging surface spaced from said projectors; means for processing said projected transparencies so as to form on said imaging surface a stereoscopic image which is a stereomodel of a terrain; means for forming an optical reference point to be maintained on an apparent ground plane of said imaging surface; means for moving said optical reference in X- and Y-directions parallel to said imaging surface; means for further moving said imaging surface in a Z-direction orthogonal to said X- and Y-directions so as to maintain said optical reference on the apparent ground surface on said stereo model during scanning; and means for encoding X- and Y-positions of said optical

reference and for encoding Z-positions on said imaging surface during scanning including means for generating digital signals representing said encoded positions;

a reproducing device including a light projector; a platen spaced apart from said projector and carrying a photosensitive sheet; a transparency mount between said projector and said platen for supporting a transparency corresponding to said stereoscopic image; a screen having an aperture formed therein adjacent said platen and in view of said transparency mount; first means for moving said aperture in X- and Y-directions parallel to said platen for scanning said photosensitive sheet; and second means for moving said platen in a Z-direction orthogonal to said X- and Y-directions during scanning; and

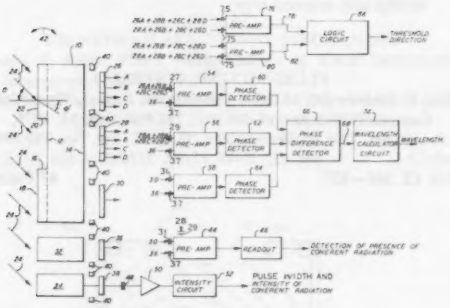
control means interfacing said recording device and said reproducing device, said control means including means for storing the digital signals representing (X, Y, Z) positions generated by said recording device during scanning; means for processing said encoded signals for compatability with said reproducing device; means for monitoring Y/Z slope of the terrain during scanning thereof by said reference, and means for generating a flag signal in response to an occurrence of an excessive Y/Z slope; and means responsive to said processed data for controlling said first and second moving means of said reproducing device during exposure of said photosensitive sheet.

4,170,416

APPARATUS FOR ANALYZING COHERENT RADIATION

Carroll R. Fencil, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 17, 1977, Ser. No. 760,165
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—346 **15 Claims**



1. Apparatus for determining the wavelength of coherent radiation in a range of wavelengths to be monitored in the presence of incoherent ambient radiation comprising:

a Fabry-Perot etalon having three regions of different preselected thicknesses corresponding to said range of wavelengths such that the optical phase difference between the second region and third adjacent region is less than π for any given wavelength in said range and the optical phase difference between the first and second regions is substantially greater than the optical phase difference between the second and third regions;

said etalon having a first surface positioned to receive coherent radiation and a second surface, the average distance between said surfaces being such that the optical path difference between transmitted portions of radiation impinging on said first surface is substantially greater than the coherence length of the noncoherent radiation but substantially less than the coherence length of the coherent radiation;

means for modulating said etalon with respect to a source of coherent radiation;

means for detecting radiation transmitted through each of said regions and for generating separate first, second and third signals, respectively responsive to the radiation leaving each of said regions;

means for detecting the phase difference between the signals detected from the second and third regions to determine the broad range of desired wavelength, and means for detecting the phase difference between the signals detected from the first and second regions within the broad range detected; and

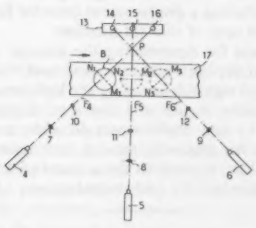
means for determining the wavelength of the coherent radiation corresponding to the detected phase differences.

4,170,417

APPARATUS AND METHOD FOR OPTICAL CONTROL OF THE PROFILE OF A BODY UTILIZING A PLANAR LASER BEAM

François G. Tourres, Octeville-sur-Mer, France, assignor to International Glass Equipment Co. S.A.R.L., Le Havre, France

Filed Mar. 25, 1977, Ser. No. 781,419
Claims priority, application France, Apr. 2, 1976, 76 09768
Int. Cl.[2] G01B *11/10*
U.S. Cl. 356—385 **11 Claims**



1. An apparatus for optically measuring the dimensions of plural sections at each of a plurality of vertically displaced areas of an object said apparatus comprising:

means for emitting plural vertically disposed respectively intersecting planar beams of parallel light rays;

means for effecting relative movement between said object and said planar beams in a horizontal direction thereby causing the beams to be intercepted by the object;

a plurality of photo-electric detectors, each being placed in the plane of a respectively corresponding one of said beams and adapted to receive only that portion of its associated planar beam which is substantially contained in a predetermined horizontal plane;

means for determining the time elapsed between the beginning and end of interception of said beam by said object;

said light emitting means including a laser associated with an optical system for transforming a cylindrical light beam output from the laser into a vertical planar light beam; and

means for moving said photoelectric detectors vertically along the height of said object to obtain a reading of its profile.

4,170,418

ALIGNMENT APPARATUS

Susumu Aiuchi; Minoru Ikeda, and Yoshio Matsumoto, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed May 25, 1976, Ser. No. 689,818
Claims priority, application Japan, May 30, 1975, 50-64272
Int. Cl.[2] G01B *11/26*
U.S. Cl. 356—400 **14 Claims**

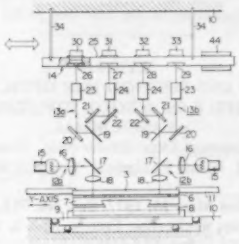
1. An alignment apparatus comprising:

first means for positioning in superimposed relationship a

mask and a wafer each having an alignment target pattern formed thereon;

an image formation optical system for forming an optical image derived from the target patterns superimposed by said first means;

a scanning means having a light sensing element mounted on a slit member having a slit formed therein, said slit member linearly reciprocating to cause both said slit and said light sensing element to scan, said slit being formed to pass the optical image formed by said image formation optical system through a small width area thereof, said light



sensing element converting the optical image received through said slit into an image signal, and said scanning means including a displacement detector for detecting the amount of scan of said slit member;

second means for determining the amount of relative displacement between said mask and said wafer in response to the imge signal detected by the light sensing element of said scanning means and the scan displacement signal detected by said displacement detector; and

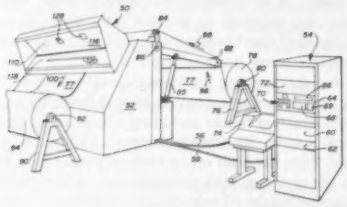
third means for relatively moving said mask and wafer for alignment in response to the amount of relative displacement determined by said second means.

4,170,419

OPTICAL WEB INSPECTION SYSTEM

Richard G. Van Tyne, Richardson; Weldon A. Sanders, Jr., Seagoville; Richard D. De La Matyr, Richardson, and David L. Gates, Plano, all of Tex., assignors to Camsco, Inc., Richardson, Tex.

Filed Feb. 23, 1977, Ser. No. 771,103
Int. Cl.[2] G01N *21/32, 21/48, 21/26*
U.S. Cl. 356—431 **9 Claims**



1. An optical inspection system for detecting imperfections in a web of fabric having a longitudinal axis perpendicular to the width of the web and moving in a plane across an inspection area comprising:

a housing disposed above the plane of the web;

radiation means disposed in said housing above the plane of the web and transverse to the longitudinal axis of the web for directing radiant energy in the form of visible light to impinge on and across the entire width of the web at the inspection area to simulate visual inspection by a human operator;

a plurality of sensor means positioned within said housing and spaced from said radiation means and transverse to the longitudinal axis of the web for receiving reflected radiation from successive transverse portions of the entire width of the web passing across the inspection area, each of said sensor means being responsive to different discrete segments of a successive transverse portion of the web, said plurality of sensor means generating electrical output signals representing the intensity of the reflected radiation from said plurality of discrete segments;

means for scanning said electrical output signals from said plurality of sensor means corresponding to successive transverse portions of the entire width of the web;

means for storing selected ones of said scanned electrical output signals from selected ones of a plurality of said successive transverse portions of the web, such that said plurality of scanned successive transverse portions of the web defines a scanned area of a predetermined length in the direction parallel to the longitudinal axis of the web and having a length in the direction of the width of the web;

means for periodically summing said stored scanned electrical output signals from said scanned area to generate a summation signal representative of the sum of reflected radiation from said selected ones of said discrete segments within said selected ones of said plurality of successive transverse portions of the web contained within said scanned area;

means for extracting at least one of said electrical output signals corresponding to one of said discrete segments contained within said scanned area of the web from said means for storing electrical output signals; and

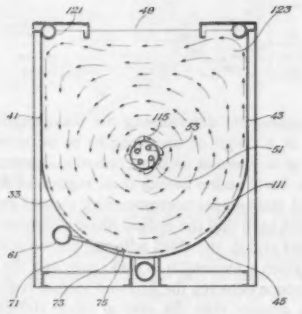
means for comparing said extracted electrical output signal with said summation signal for generating a defect signal indicative of whether an imperfection exists within a discrete segment contained within said scanned area of the web and within one of said selected ones of said plurality of successive transverse portions of the web contained within said scanned area.

4,170,420

FLUID MIXING SYSTEM

Gene E. Underwood, 4815 W. Yellowstone, Casper, Wyo. 82601

Continuation-in-part of Ser. No. 722,668, Sep. 13, 1976, abandoned. This application Jun. 27, 1977, Ser. No. 810,590
Int. Cl.[2] B01F *15/02, 5/10*
U.S. Cl. 366—137 **47 Claims**



1. A fluid mixing system comprising:

a container having a given length,

injection means for injecting fluid into said container at a plurality of spaced apart positions along its length and in a direction to cause the fluid to swirl around a central axis extending along the length of said container,

conduit means located in said container generally along said central axis and having a plurality of spaced apart inlet

means along its length for the flow of fluid from said container into said conduit means, and

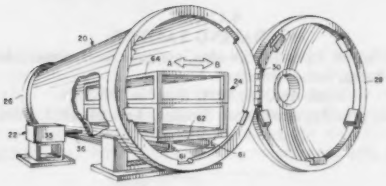
means for withdrawing fluid from said conduit means and for flowing said withdrawn fluid into said injection means for injection back into said container.

4,170,421

RECIPROCAL STERILIZING AGITATOR SYSTEM (RSAS)

David P. Balding, El Toro, and Victor V. Menayan, Lake Forest, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Sep. 5, 1978, Ser. No. 939,627
Int. Cl.[2] B01F *15/06*.
U.S. Cl. 366—144 **9 Claims**



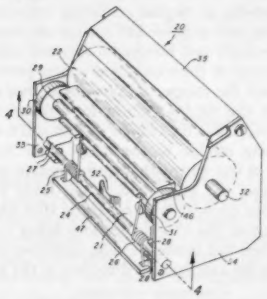
1. A reciprocal sterilizing agitator system comprising chamber means which may be sealed and elevated to sterilizing temperatures with a controlled environment enclosed therein, product support means in said chamber for enabling a reciprocal motion to be imparted to said product, and driving power source means outside of said chamber for transmitting a reciprocal motion through walls of said chamber to said product support means.

4,170,422

PRINTHEAD ALIGNMENT MECHANISM

Frank T. Bilek, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 546,488, Feb. 3, 1975, abandoned. This application Apr. 28, 1976, Ser. No. 680,835
Int. Cl.[2] B41J *3/04*
U.S. Cl. 400—120 **14 Claims**



1. In a non-impact type printer having a printhead to be pressed against a recording medium, a printhead alignment mechanism comprising:

(a) a frame;

(b) a print roller, rotatably mounted on the frame for moving the print medium;

(c) a mounting shaft mounted on the frame;

(d) a bracket, to which the printhead is secured, having bearing means engaging the mounting shaft and a pivot projection, bearing against the mounting shaft, to permit pivoting in a direction around an axis that is orthogonal to the axis of rotation of the print roller; and

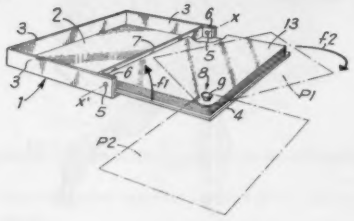
(e) resilient means, connected to the bracket to urge the printhead toward the print roller, permitting the printhead to pivot in a direction around an axis parallel to the axis of rotation of the print roller.

4,170,423

SYSTEM FOR THE HOUSING AND DISPLAY OF PLANE DATA CARRIERS

Jean Bourbon, Saint-Lupicin, France, assignor to Societe Anonyme: Tournerie du Jura-Ets A. Bourbon & Fils, France

Filed Mar. 30, 1978, Ser. No. 891,522
Claims priority, application France, Mar. 25, 1977, 77 10145
Int. Cl.[2] B42F *13/00*
U.S. Cl. 402—70 **8 Claims**



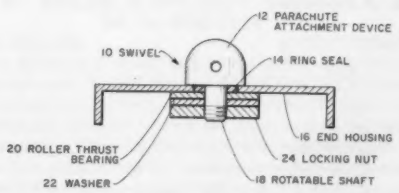
1. A casing for the protection and consultation of plane data carriers such as cards of the type comprising a box supporting, by means of a pivoting axis, a pivoting lid whose inner face with respect to the box is provided with a pivot on which are filed the cards which can be displayed in fan order or aligned with the lid to be placed inside the box when the said lid is brought into the position of closing the box, wherein the lid comprises, on the one hand, pivot situated adjacent one of the corner opposite the pivoting axis connecting the said lid to the box, and on the other hand, a projection acting as a stop means for the alignment of the said cards and, furthermore, an edge reconstituting at least partly the periphery of the casing when the said lid closes the box.

4,170,424

PARACHUTE ATTACHMENT SWIVEL

Helmut Boehm, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1976, Ser. No. 652,035
Int. Cl.[2] F16D *1/12, 3/00*
U.S. Cl. 403—164 **8 Claims**



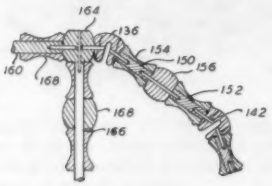
1. A swivel for attaching a parachute to a hermetically sealed housing to prevent entanglement of said parachute comprising:

(a) means for attaching said parachute to said swivel;

(b) a rotatable shaft connected to said means for attaching said parachute, said shaft disposed within an aperture in said housing;

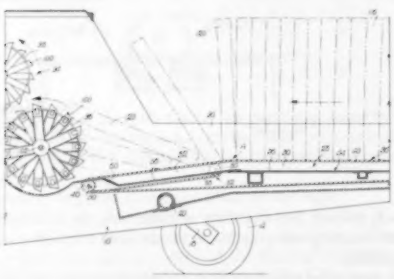
(c) means for securing said shaft to said housing;
(d) a roller thrust bearing disposed between said means for securing and said housing such that said housing rotates freely from said swivel preventing parachute entanglement; and
(e) meand disposed within said aperture for providing a hermetical seal between the interior of said housing and the atmosphere outside said housing;
wherein said swivel provides a low friction attachment to said housing capable of withstanding high impact forces created by said parachute.

4,170,425
MODULAR STRUCTURAL MEMBER
Abraham H. Brown, 449 Viola Rd., Spring Valley, N.Y. 10977
Filed Jan. 10, 1978, Ser. No. 868,323
Int. Cl.[2] F16B *7/18*
U.S. Cl. 403—296 **31 Claims**



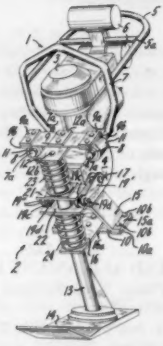
1. A modular structural member comprising:
(a) at least first and second rod means releasably secured to one another for simultaneous rotation about a common axis and having two free ends;
(b) means for releasably engaging said free ends of said rods upon said simultaneous rotation of said rods about said common axis and in the same direction;
(c) means for coupling said first and second rods for said simultaneous rotation; and
(d) at least one hollow bead member upon at least one of said rods, said bead being disposed between said engaging means and said coupling means; upon said rotation, said bead being held fixedly, with respect to said one rod, by said coupling and engaging means.

4,170,426
BALE DISINTEGRATOR AND METHOD
Bruce L. White; Edward S. Arter, both of Newton, Kans., and Mark W. Kiner, Perry, Okla., assignors to Hesston Corporation, Hesston, Kans.
Filed Dec. 27, 1977, Ser. No. 864,590
Int. Cl.[2] B60P *1/08, 1/38*
U.S. Cl. 414—111 **12 Claims**



1. In a machine for disintegrating bales having a series of separable flakes of material packed flatly against one another, the improvement comprising:
disintegrating mechanism;
a conveyor for progressively delivering a said bale toward said mechanism with said flakes in a generally upstanding disposition; and
means for separating at least a leading end flake from the bale as it nears said mechanism and for presenting said separated end flake to said mechanism,
said conveyor being disposed to advance said bale substantially horizontally, said separating means including a downwardly and forwardly extending incline with respect to the direction of travel of said bales for inducing the upright end flake of the bale to fall forwardly by gravity upon reaching said incline, the beginning of said incline being disposed rearwardly behind the forward termination of said conveyor, and said mechanism being disposed at said forward termination of the conveyor.

4,170,427
VIBRATING TAMPER
Gunnar Grane, Lyckeby, Sweden, assignor to Dynapac Maskin Aktiebolag, Solna, Sweden
Filed Apr. 13, 1978, Ser. No. 896,200
Claims priority, application Sweden, Apr. 14, 1977, 7704260
Int. Cl.[2] E01C *19/35*
U.S. Cl. 404—133 **10 Claims**

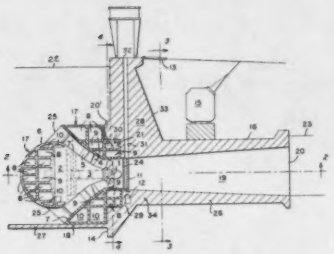


1. A manually controlled vibrating tamper for the compaction of soil, concrete, asphalt and similar materials, the tamper comprising a tamper section having a tamping plate, and an engine section having an engine resiliently connected to the tamper section by two parallel leaf springs arranged at right angles to the vibratory and horizontal forward motion of the tamper and attached at their ends and center portions to the engine section and the tamper section respectively, a forked lever pivoted on the engine section for transmitting power from the engine section to the tamper section and for imparting a forward tamping motion to the tamper, the forked lever being connected at one end with a spring system arranged on the tamper section, the other end of the lever having two parallel projections embracing an eccentric stud adapted to be driven by the engine, the fork projections being oriented in a vertical plane when said tamper is in its operative position and at right angles to the longitudinal direction of the leaf springs.

4,170,428
DAM WITH SUSPENDED HYDROELECTRIC STATION
Francisco J. G. Atencio, 3105 Diamante, Entre Rios, Argentina
Filed Jul. 11, 1977, Ser. No. 814,549
Int. Cl.[2] E02B *9/00*
U.S. Cl. 405—78 **8 Claims**

1. In a water storing dam including a main body having fluid conveying means therethrough, the improvement comprising, one or more hydromotive assemblies positioned adjacent said main dam body, each said hydromotive assembly including a main body provided with a capsule contained therein, an en-

ergy generation unit within said hydromotive assembly capsule, peripheral walls on said hydromotive assembly main body and contained capsule defining a fluid flow conduit substantially extending through the axial extent of said hydromotive assembly, said conduit extending between first and second



open ends at opposite ends of said hydromotive assembly, one said open end juxtaposed said dam fluid conveying means, buoyancy means within said hydromotive assembly capsule, said buoyancy means operable to exert a lifting force upon said hydromotive assembly when said one open end thereof is juxtaposed said dam fluid conveying means.

4,170,429

INSTALLATION FOR INSPECTING AND REPAIRING INSTALLATIONS IN DEEP WATER

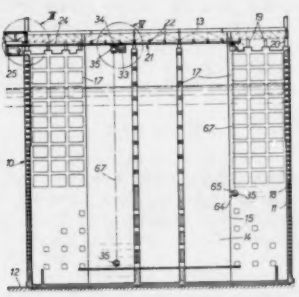
Francis D. A. Mathieu, Nogent-sur-Marne, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris", Paris, France

Filed Sep. 21, 1977, Ser. No. 835,227

Claims priority, application France, Sep. 29, 1976, 76 29252; Feb. 15, 1977, 77 04204

Int. Cl.[2] E02B *15/02*

U.S. Cl. 405—195 **5 Claims**



1. An installation comprising an infrastructure the lower part of which is submerged and a superstructure located above the water, the combination of a track arranged on said superstructure, a trolley adapted to be moved along said track, a diving bell suspended from said trolley, means on said trolley for lowering and raising said diving bell adjacent the submerged part of said infrastructure for inspection, a motor tractor on said track adapted to be coupled to said trolley, a motorized bobbin on said tractor, an umbilical cord attached to said bobbin and to said diving bell, a winch on said trolley associated with said diving bell for lowering and raising said bell, means on said trolley for driving said winch in synchronism with said bobbin, a winch on said motor tractor, a life boat attached to said winch, a second motorized bobbin on said tractor, an umbilical cord attached to said second bobbin and to life boat, said motor tractor comprising a machinery comprising a diesel engine, an electric generator and pumps driven by said engine, hydraulic motors fed by said pumps for driving said bobbins and winches, an electric relief motor adapted to drive said pumps in case of failure of said diesel engine and battery means for feeding said electric relief motor.

4,170,430

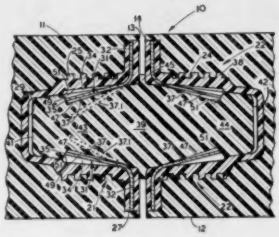
FASTENING DEVICE

Richard Mrotzek, 19575 - 88th Ave., Surrey, B.C., Canada

Filed Aug. 2, 1978, Ser. No. 930,550

Int. Cl.[2] E04C *1/06*

U.S. Cl. 403—20 **10 Claims**



1. A fastener for connecting a pair of structural pieces comprising:

(a) at least one socket member adapted to be inset in one of the pieces;

(b) yieldably resilient detent means mounted in the socket member for radial movement between a normal inwardly extended position and an outwardly retracted position,

(c) a dowel having a slidable, rotatable fit in the socket member,

(d) means for connecting the dowel to the other of the pieces for rotation,

(e) the dowel having a recessed portion providing an abutement face for enabling the detent means, when aligned with the said recess portion, to move towards the extended position in the path of and engaging the abutement face so as to releasably lock the dowel in the socket member,

(f) gripable means on the dowel adapted to be gripped by a tool inserted between the pieces for rotating the dowel to a release position in which the abutement face is positioned out of alignment with the detent means for enabling the dowel to be withdrawn from the socket member.

4,170,431

OFFSHORE PLATFORMS

Eric Wood, Cosy Cottage, HaggsHill, Ossett, Yorkshire, England

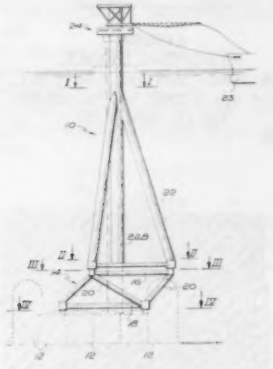
Filed Dec. 29, 1977, Ser. No. 865,379

Int. Cl.[2] E02D *21/00*

U.S. Cl. 405—202 **5 Claims**

1. An offshore platform support structure comprising a column structure for standing on the sea bed, the structure being in three column sections, a lower section, an intermediate section and an upper section, the lower section and intermediate section being located one relative to the other by knuckle type joints so that the intermediate section is relatively tiltable from an initial position relative to the lower section about any of several circumferentially arranged tilting axes lying transverse to the upright platform axis, and the intermediate section and upper section being located one relative to the other by knuckle type joints so that the upper section can tilt relative to the intermediate section in the same manner in which the intermediate section can tilt relative to the lower section, the tilting axes between the lower and intermediate sections being angularly offset relative to the axes of relative

tilting between the intermediate and upper sections, and the structure further including damping means arranged to control



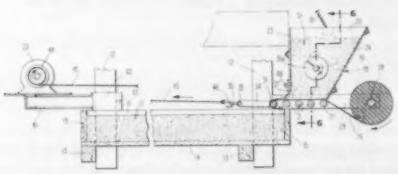
the rate of return of said sections to the initial position from a relatively tilted position.

4,170,432

MUSHROOM FARMING APPARATUS AND METHOD

Louis J. Pia, Box 134, Avondale, Pa. 19311

Filed Mar. 31, 1977, Ser. No. 783,222
Int. Cl.[2] B65B *1/04*; B65G *15/28*; A01G *1/04*
U.S. Cl. 414—269 **4 Claims**



1. An apparatus for applying compost or casing soil to mushroom beds, which apparatus comprises:

(a) hopper means adapted to hold a quantity of casing soil or compost, said hopper having a discharge opening formed by a fixed portion thereof and a movable flexible sheet portion attached thereto, which sheet portion is adapted to be moved horizontally away from the discharge opening,

(b) detachable means adapted to position the hopper means in juxtaposition outboard of the end of a mushroom bed,

(c) roll means adapted to contain a rolled supply of said flexible sheet,

(d) supporting means adapted to horizontally support a portion of said flexible sheet so as to form said discharge opening,

(e) cross-bar means adapted to have the flexible sheet retroverted thereabout wherein the end of the flexible sheet free of said roll means is secured to a portion of said hopper means, whereby upon traction being applied to said cross-bar the sheet is moved horizontally away from said discharge opening in a direction normal thereto and withdrawn from said roll means,

(f) continuous cable means provided with means for attachment to said cross-bar means,

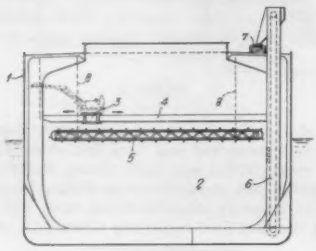
(g) winch means adapted to contain and wind said cable means thereon, whereby upon operation of said winch means when said cable means is attached to said cross-bar means any properly sized pulverulent material contained in said hopper is discharged therefrom in a continuous layer upon said horizontally moving sheet portion, which layer is thereupon continuously dropped from the retroverted edge of the sheet portion.

4,170,433

APPARATUS FOR EMPTYING BULK MATERIAL FROM A STORAGE CHAMBER

Kaare Haahjem, Vigra, Norway, assignor to Haahjem Mekanishe A/A, Vigra, Norway

Filed Jan. 17, 1978, Ser. No. 870,253
Claims priority, application Norway, Jan. 17, 1977, 770131
Int. Cl.[2] B65G *65/38*
U.S. Cl. 414—313 **11 Claims**



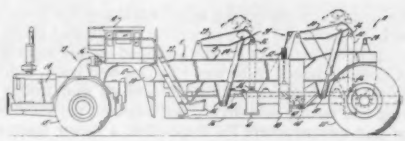
1. Apparatus for emptying bulk material from a storage chamber, said apparatus comprising first rake means in said storage chamber for transporting material in the storage chamber in a first direction therein, means for moving said first rake means vertically, means for moving said first rake means transversely of said first direction, vertical transport means for transporting material from the storage chamber upwardly for removal from said storage chamber, second rake means in said storage chamber extending at an angle with respect to said first rake means for transporting material in the storage chamber in a second direction therein to said vertical transport means, and means for moving said second rake means vertically, said second rake means being positioned adjacent one end of said first rake means for receiving material transported by said first rake means in said first direction and for transporting the material in said second direction to said vertical transport means.

4,170,434

LOAD HANDLING APPARATUS

Edward S. Kress, Brimfield; William L. LaBerdia, Pekin; Jackson C. Medley, Brimfield, and Merrill E. Pinter, Kewanee, all of Ill., assignors to Kress Corporation, Brimfield, Ill.

Filed Dec. 19, 1977, Ser. No. 861,537
Int. Cl.[2] B60P *3/00*
U.S. Cl. 414—459 **10 Claims**



1. A load handling apparatus comprising, in combination:

a main frame comprising a pair of support beams arranged substantially parallel and spaced apart from one another by an amount sufficient to straddle the load to be handled;

a pair of lift frames, each of said lift frames being pivotally mounted to said support beams to span the space therebetween, said lift frames being movable between a lowered position in which portions of said lift frames may rest on said support beams and a raised position in which said portions of said lift frames are pivoted up and away from

said support beams, the difference in elevation of said lift frame portions relative to said main frame between said lowered and raised positions providing the lifting capability of said lift frames;

a pair of load engaging and clamping members;

two pair of links, each pair of links being flexibly mounted to said portion of one of said lift frames to hang between said support beams, one link from each pair of links flexibly supporting one of said load engaging and clamping members adjacent and substantially parallel to one of said support beams, the other link from each pair of links flexibly supporting the other of said load engaging and clamping members adjacent and substantially parallel to the other of said support beams;

first means for actuating said lift frames to raise and lower said links and said load engaging and clamping members relative to said main frame; and,

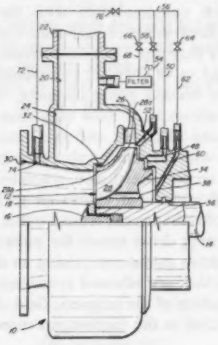
second means for actuating said load engaging and clamping members to move said members toward and away from one another to engage and release a load straddled by said main frame.

4,170,435

THRUST CONTROLLED ROTARY APPARATUS

Judson S. Swearingen, 2235 Carmelina, Los Angeles, Calif. 90064

Filed Oct. 14, 1977, Ser. No. 842,036
Int. Cl.[2] F01D *3/02, 3/00*
U.S. Cl. 415—1 **24 Claims**



1. Rotary apparatus comprising:

an outer body member having an internal generally axially directed first thrust area;

an inner body member mounted at least partially within said outer body member for relative rotation of said body members and having a second generally axially directed thrust area generally opposed to said first thrust area;

wherein said body members define fluid passageway means and said thrust areas define a fluid-receiving space therebetween in communication with said passageway means;

first annular seal means sealing between said thrust areas;

second annular seal means of lesser diameter than said first seal means and also sealing between said thrust areas, whereby an annular first portion of said fluid-receiving space is defined between said two seal means;

said apparatus defining two gaps located respectively an opposite sides of said first and second seal means from said first portion of said fluid-receiving space, and said gaps each communicating with a respective one of two zones of differing pressure external to said first portion;

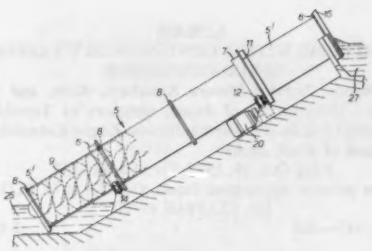
and thrust control means for selectively varying the fluid pressure in said first portion of said fluid-receiving space, said thrust control means including means for selectively providing pressuring equalizing communication between said first portion and said two gaps.

4,170,436

SCREW PUMPS WITH MODULAR CONSTRUCTION

Nigel D. Q. Candler, Hungerford, England, assignor to Sigmund Pulsometer Pumps Limited, Reading, England

Filed Sep. 9, 1977, Ser. No. 831,911
Int. Cl.[2] F04D *3/00*
U.S. Cl. 415—73 **9 Claims**



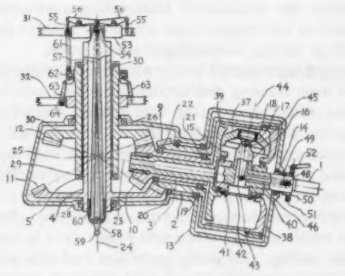
1. A module for forming, together with a number of like modules, an archimedean screw pump, having a cylinder wall and at least one internal helicoidal vane, said module comprising a first portion forming part of the wall of a cylinder and a second helicoidal portion projecting inwardly from said first portion, said second portion constituting part of a helocoidal vane upon assembly of like modules to form said pump.

4,170,437

HELICOPTER PRIMARY FLIGHT CONTROLS

Kazimierz Korsak, 827 Tamlei Ave., Thousand Oaks, Calif. 91360

Filed Feb. 23, 1976, Ser. No. 660,643
Int. Cl.[2] B64C *27/80*
U.S. Cl. 416—130 **1 Claim**



1. In a helicopter equipped with a pair of lifting rotors with adjustable blades, and adjustment means thereof, and having a common axis of rotation, said rotors being connected to power means including a transmission for driving said rotors in opposite directions, said transmission including a traction drive differential means, comprising a pair of toroidal discs with one of said discs being connected to one rotor and the other one to the other rotor, both said discs preloaded by spring means against each other to frictionally engage them with planets of said differential means, each of said planets rotatably connected to a tilt control lever, all of said levers hingedly connected to a planet carrier, said carrier connected to and being driven by an input shaft of said transmission; in combination said transmission also including means for controlling said helicopter in yaw which is being accomplished by monitoring the anti-torque action of said rotors on said helicopter, effected through a variation of operating pitch diameters of said toroidal discs as a result of changing positions of tilt control levers,

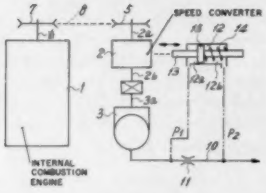
using a push-pull rod operatable via a slip-ring by the helicopter yaw flight control means.

4,170,438

FLUID PUMP WITH A CONTINUOUSLY VARIABLE SPEED CONVERTER

Yukio Kondo, Toyota; Minoru Kawabata, Aichi, and Mikio Suzuki, Hekinan, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Aichi, Japan

Filed Oct. 19, 1977, Ser. No. 843,667
Claims priority, application Japan, Oct. 22, 1976, 51/127649
Int. Cl.[2] F04B *49/00*
U.S. Cl. 417—223 **5 Claims**



1. A fluid pump driven by an engine, comprising:

a main housing having an outlet passage;

a continuously variable speed converter provided in said main housing and composed of input and output shafts rotatably carried by said main housing in axial alignment with each other and of a pair of friction discs provided respectively on said input and output shafts in face-to-face relation for frictionally transmitting rotational driving power to said engine from said input shaft to said output shaft at various output/input speed ratios;

a pump casing received within a pressure chamber formed in said main housing and having an internal cam bore;

a pump rotor mounted on said output shaft for rotation together therewith and received in said internal cam bore;

side plates urged to be held in contact with both side surfaces of said pump casing and said pump rotor disposed therebetween for enabling said pump casing and said pump rotor to deliver pressurized fluid into said pressure chamber and said outlet passage when said pump rotor is rotated, said pump casing, said pump rotor and said side plates being integrally movable in an axial direction of said output shaft so as to press one of said friction discs toward the other friction disc when pressurized fluid is supplied into said pressure chamber;

a throttle element provided in said outlet passage;

an actuator having a movable member whose two separate fluid reactive surfaces are responsive respectively to pressurized fluids which are delivered by the rotation of said pump rotor respectively through and not through said throttle element;

a speed change mechanism incorporated in said speed converter for changing the transmission ratio of said rotational driving power from said engine to said pump rotor and being operatively connected with said movable member so as to be controllably operated thereby; and

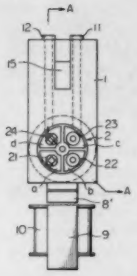
means cooperating with said actuator for operating said speed change mechanism to maintain approximately constant the pressure difference between fluids before and behind said throttle element.

4,170,439

TWIN AIR PUMP

Masahiro Hase, 12-102 Mogusadanchi, 1261 Wada, Tama-shi, Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 867,055
Int. Cl.[2] F04B *21/02*
U.S. Cl. 417—413 **6 Claims**



1. An electromagnetic air pump comprising a valve body having two outlet pipes and four valve chambers each provided with a check valve, and a pair of pump chambers each provided with a pump diaphragm, wherein the first valve chamber communicates with the atmosphere and the first pump chamber, whereby the check valve thereof allows air to flow only from the atmosphere to the first pump chamber, and said first pump chamber communicates with the third valve chamber which communicates with the first outlet pipe, whereby the check valve of said third valve chamber allows air to flow only from the first pump chamber to the first outlet pipe; the second valve chamber communicates with the atmosphere and the second pump chamber, whereby the check valve thereof allows air to flow only from the atmosphere to the second pump chamber, and said second pump chamber communicates with the fourth valve chamber which communicates with the second outlet pipe, whereby the check valve of said fourth valve chamber allows air to flow only from the second pump chamber to the second outlet pipe; and the pump further comprising drive means for pulsating said pump diaphragms, the drive means comprising an electromagnet and a pair of arms which are vibrated symmetrically in accordance with the alternation of the magnetic field of the electromagnet and are connected to the diaphragms respectively.

4,170,440

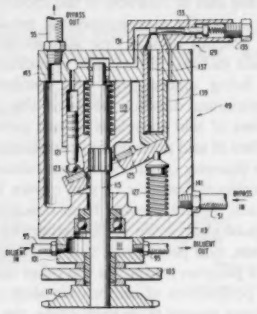
FEEDER FOR APPARATUS FOR EJECTING URETHANE FOAM FORMED BY THE MIXTURE OF RESIN AND ISOCYANATE WITH FLUSHING LIQUID

Frederick E. Gusmer; Denis S. Commette, both of Mantoloking, and Robert A. Bairunas, Bordentown, all of N.J., assignors to Gusmer Corporation, Lakewood, N.J.

Division of Ser. No. 727,981, Sep. 29, 1976, Pat. No. 4,131,395. This application Sep. 12, 1977, Ser. No. 832,522
Int. Cl.[2] F04B *23/04;* F16J *15/40*
U.S. Cl. 417—426 **2 Claims**

1. A feeder for apparatus for ejecting urethane foam formed by the mixture of resin and isocyanate, the feeder comprising a unitary assembly of means for pumping resin and means for pumping isocyanate toward said apparatus, said isocyanate pumping means comprising at least one rotary pump having a rotary drive shaft, and means for bathing said drive shaft in

tricresyl phosphate that circulates in a closed circuit in a closed system under positive pressure thereby continuously to dilute



and flush away isocyanate that leaks along said rotary drive shaft.

4,170,441

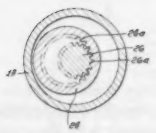
SPEED CHANGER FOR IN-HOLE MOTORS

Kurt H. Trzeciak, Fountain Valley, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Oct. 21, 1977, Ser. No. 844,375

Int. Cl.[2] F01C *1/10*

U.S. Cl. 418—48 **24 Claims**



1. In-hole fluid motor apparatus comprising: a fluid motor having a stator and a fluid driven helicoidal rotor having a drive end which rotates in one direction and orbits about its center in the opposite direction; change speed means including a drive member connected with said rotor and a driven member; a drive shaft connected with said driven member, means concentrically mounting said drive shaft with respect to said stator; and means enabling orbital motion of said drive member with respect to said driven member, one of said drive member or said driven member comprising a housing; and including means sealing said housing to contain a lubricant for said members while allowing said orbital motion.

4,170,442

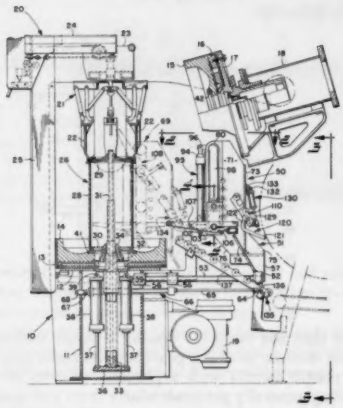
TIRE PRESS UNLOADER

Anand P. Singh, Youngstown, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Jun. 15, 1978, Ser. No. 915,055

Int. Cl.[2] B29H *5/02*

U.S. Cl. 425—38 **34 Claims**



1. An unloader for a tire curing press comprising a horizontally movable unloader frame, pivoting tire elevating and supporting platform means mounted on said unloader frame for vertical movement relative thereto, means thus to move said platform means, and means to keep said platform from pivoting during the initial upward movement thereof and to require said platform to pivot during the final vertical upward movement thereof, said means to require said platform to pivot comprising an obstruction on said unloader frame.

4,170,443

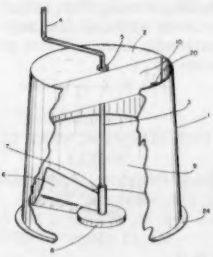
APPARATUS FOR FORMING SPRINKLER HEAD PROTECTOR

Conrad R. Becker, 818 Shetland Rd., Las Vegas, Nev. 89107

Filed Aug. 21, 1978, Ser. No. 935,456

Int. Cl.[2] B28B *7/00*; B29C *5/00*

U.S. Cl. 425—110 **9 Claims**



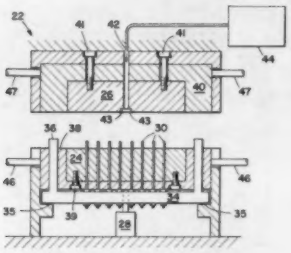
1. Apparatus for forming a cast concrete protection about an installed lawn sprinkler, comprising: a peripheral housing open at the bottom and having an aperture for receiving wet cement aggregate, said housing having rotably mounted therein a trowel blade having a lower edge which can be rotated in a substantially horizontal plane, a shaft for rotating said blade and a cover means attached to said shaft, said cover means being adapted to cover a sprinkler head and exclude wet cement aggregate therefrom during said forming.

4,170,444

MOLD FOR MAKING IMPEDANCE MEASURING MODULE

James H. Fleming, Palo Alto, and Melvin Rudin, Los Altos, both of Calif., assignors to Bactomatic, Inc., Palo Alto, Calif.

Division of Ser. No. 633,213, Nov. 19, 1975, Pat. No. 4,067,951.
This application Jun. 22, 1977, Ser. No. 809,143
Int. Cl.[2] B29F *1/10*
U.S. Cl. 425—123 8 Claims



1. An injection mold for making a plastic impedance measurement module having a generally flat metal grid imbedded in the plastic thereof with a plurality of pairs of electrodes upstanding generally perpendicularly from said grid, one pair into each of a plurality of chambers, said electrode being uncoated by said plastic, comprising:

(1) a first mold half having a first generally flat portion defining a top of a base of said module and a plurality of channels extending from said first portion into said first mold half defining said plurality of chambers and including a plurality of pairs of spaced apart slots extending from said first portion into said first mold half, one of said pairs of slots extending into each of said chambers for accepting and preventing coating of said electrodes, said first mold half including a plurality of rods movable generally perpendicularly to said first portion within a plurality of passages, with a top end of each of said rods including therein one of said slots;

(2) a second mold half having a second generally flat portion for mating with said first portion to form said injection mold, said second portion having support means for said metal grid extending therefrom toward said first portion;

(3) means associated with at least one of said mold halves for moving said first and second mold halves together and apart;

(4) means in communication with at least one of said portions for injecting plastic between said first and second mold halves when they are together; and

(5) means associated with said first mold half for extending said rods outwardly from said first portion towards said second portion.

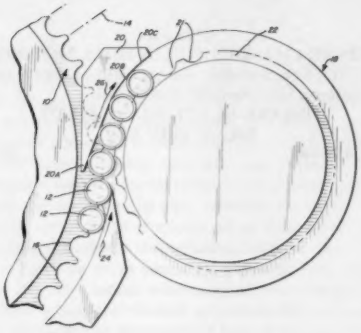
4,170,445

APPARATUS FOR FORMING SEAL LINER IN CROWN SHELL

Kunihiro Nishijima, Okayama, Japan, assignor to Uchiyama Kogyo Kaisha, Ltd., Okayama, Japan

Filed Sep. 16, 1977, Ser. No. 833,766
Int. Cl.[2] B29C *13/02*
U.S. Cl. 425—126 R 2 Claims

1. A machine for forming moldable thermoplastic material into a seal liner in the inside of a crown, comprising: a rotatably mounted crown shell carrier having a first set of circumferentially spaced notches defining a plurality of sockets open to the periphery thereof for receiving crowns and moving said crowns to a dispensing station to receive a measured amount of thermoplastic material and subsequently to a heating station where said crowns and thermoplastic material are heated while on said crown shell carrier, a press drum defining a second set of circumferentially spaced crown-receiving notches for receiving said crowns from said crown shell carrier, said press drum being disposed adjacent the crown shell carrier and being rotatably mounted on an axis parallel to and laterally spaced from the axis of rotation of the crown shell carrier to partly define a transfer means-receiving space therebetween, each of said notches of said first and second sets having a radially inward middle portion, said sprockets of said crown shell carrier being spaced from said notches on said press drum, the minimum distance between the radially inward middle portions of said sprockets of said crown shell carrier and said notches of said press drum is substantially greater than the maximum diameter of said crown but substantially less than twice the maximum diameter of said crown for substantially preventing each of said crowns from concurrently engaging said sprockets of said crown shell carrier and said notches of said press drum, said press drum and said crown shell carrier each having a periphery adjacent the outer extremity of their notches, the peripheries of said crown shell carrier and said press drum being spaced from each other, the minimum spacing between the peripheries of said crown shell carrier and said press drum being less than the maximum diameter of a said crown for generally maintaining said crowns in engagement with only one of said sets of notches during transfer of said



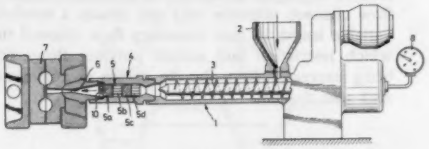
crowns from said crown shell carrier to said press drum, said press drum having a plurality of reciprocable molding plungers on said drum in alignment with the crown-receiving notches on said press drum, drive means for rotating the crown shell carrier in synchronism with said press drum, transfer means located adjacent a line between said axes of said crown shell carrier and said press drum and positioned in the transfer means-receiving space between the crown shell carrier and the press drum, said transfer means including a guide surface facing generally towards said press drum for guiding and directing the crowns from the sprockets on the crown shell carrier to the notches on the press drum generally before said plungers engage said crowns, and plunger positioning means operatively associated with said press drum for positioning said plungers to moldably engage said thermoplastic material contained in each of said crowns only after said crown has been completely transferred and spaced from said sprockets of said crown shell carrier and guided onto said notches of said press drum and for maintaining said plungers in molding engagement with said thermoplastic material for a sufficient period of time on said press drums to mold the thermoplastic material therein into a resilient sealing liner and allow said resilient sealing liner to set.

4,170,446

PLASTICS-PROCESSING MACHINE

Gerhard Schutz, and Rolf Kocher, both of Winterthur, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 20, 1977, Ser. No. 789,190
Claims priority, application Switzerland, Apr. 29, 1976, 5381/76
Int. Cl.[2] B29B *1/06*
U.S. Cl. 425—199 14 Claims



1. A plastics-processing machine comprising

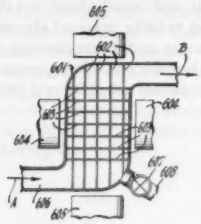
a mixer having a tubular jacket disposed on an axis and a static mixing device within said jacket, said mixing device having a hydraulic diameter of not more than eight millimeters (8 mm) and including at least one insertion member composed of guide elements disposed in layers and forming flow channels, said flow channels of adjacent layers being inclined relative to one another, said guide elements subtending an angle less than ninety degrees relative to said axis with said flow channels of adjacent layers disposed in intersecting relation.

4,170,447

METHOD OF SEPARATING SOLID PARTICULATE

H. Lawrence Goldstein, East Brunswick, and Henry Shaw, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 11, 1977, Ser. No. 758,443
Int. Cl.[2] B03C *3/00*; B01D *53/34*
U.S. Cl. 423—215.5 16 Claims



1. A process for preventing the emission of solid particulates to the atmosphere from the effluent gas stream produced during the combustion of a carbonaceous fuel comprising the steps of:

(a) combusting a solid particulate containing carbonaceous fuel under oxidative conditions with a suitable mixture of air or oxygen, wherein said carbonaceous fuel additionally contains a soluble salt or suspension of a metal selected from the group consisting of Fe^{+3}, Co^{+3}, Ni^{+2} or a mixture thereof which is converted to a magnetic oxide during combustion to the fuel; and

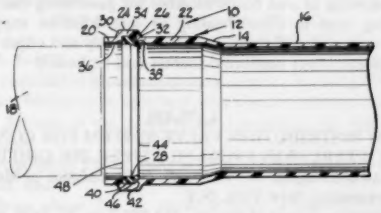
(b) passing the oxidized combustion effluent containing entrained solid particulates and magnetic oxides through at least one magnetic separator having an imposed magnetic field to thereby separate the particulate solids from the gas stream containing the combustion effluent.

4,170,448

ASSEMBLY FOR FORMING THE BELL OF A BELL SPIGOT JOINT

David W. French, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Aug. 22, 1977, Ser. No. 826,586
Int. Cl.[2] B29C *17/00*
U.S. Cl. 425—393 11 Claims



1. An assembly for forming a bell end in one end section of a plastic pipe, which end section has been heated to its state of thermal deformability, said assembly comprising:

(a) first means for forming from said heated end section a diametrically enlarged axial portion and a transverse end wall joining said enlarged portion with the rest of said pipe;

(b) second means for

(i) substantially uniformly thickening the cross-sectional configuration of said enlarged portion by decreasing its length, and at the same time

(ii) integrally forming outwardly protruding rib means on the inner surface of said transverse end wall, said rib means being located radially inwardly from the inner surface of said enlarged portion so as to define a space therebetween;

(c) said thickened enlarged portion being adapted to receive therein an annular sealing gasket against said end wall such that an end segment of said enlarged portion extends beyond said gasket and such that at least a portion of said gasket is located within said space; and

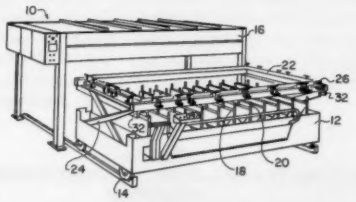
(d) third means for inwardly deforming said end segment of said enlarged end portion, whereby to lock said gasket in place.

4,170,449

CLAMPING FRAME FOR PLASTIC FORMING APPARATUS

Jack N. Shuman, P.O. Box 3347, Charlotte, N.C. 28203

Filed Jan. 12, 1978, Ser. No. 868,936
Int. Cl.[2] B29C *25/00*
U.S. Cl. 425—445 8 Claims



1. A clamping frame for supporting a sheet of plastic material for use in apparatus for heating and forming said sheet of plastic material into predetermined configurations, said clamping frame comprising:

(1) a frame member formed by thermally conductive material and constructed to define an opening across which said sheet of plastic material is held during said forming

thereof, said frame member including a surface portion for supporting the edges of said sheet of plastic material and including a longitudinally extending opening located within said frame member adjacent to said supporting surface,

(2) clamping means associated with said frame member for holding said supported edges of said plastic material against said supporting surface of said frame member, and

(3) separate heating means disposed within said longitudinal opening of said frame member for generating and releasing heat to cause heating of said adjacent supporting surface of said frame member whereby said edges of said plastic sheet supported thereat will be heated.

4,170,450

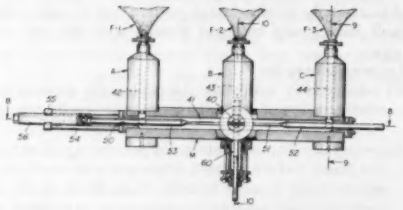
FLOW DISTRIBUTION VALVE SYSTEM FOR CONTROL OF EXTRUSION FROM MULTIPLE DIE ORIFICES

F. John Herrington, Jr., Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 753,747, Dec. 23, 1976, Pat. No. 4,081,231. This application Nov. 7, 1977, Ser. No. 849,050

Int. Cl.[2] B29F *3/06*

U.S. Cl. 425—464 **1 Claim**



1. An apparatus for controlling the flow of molten polymer from one or more feed sources to three or more extrusion die orifices, said apparatus comprising:

(a) a manifold comprising one or more inlet openings; a primary flow channel within said manifold in communication with said inlet openings; secondary end-branching flow channels branching off from each of the opposing end portions of said primary flow channel; one or more intermediate secondary flow channels in communication with said primary flow channel and disposed in between said end-branching secondary flow channels; and an individual extrusion die orifice for each of said secondary flow channels and in communication therewith;

(b) flow restriction means in said primary flow channel, said means comprising a rod of reduced cross section, relative to the cross section of said channel, said rod being laterally displaceable in said primary flow channel and further characterized by having at least one portion of its cross-sectional area enlarged whereby lateral displacement of said rod controls the flow of said molten polymer to said end-branching secondary flow channels; and

(c) restriction means, disposed in each of said one or more intermediate secondary flow channels, comprising a laterally displaceable elongated rod of reduced cross section, relative to the cross section of its respective secondary flow channel, whereby said rod creates a restriction of variable length in said secondary flow channel through which restriction said molten polymer flows prior to being expressed from the die orifice in communication with said channel.

4,170,451

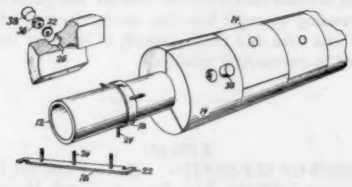
SKID PIPE COVERING

Donald G. Luff, Lansdale, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 14, 1976, Ser. No. 732,274

Int. Cl.[2] F27D *3/02*

U.S. Cl. 432—234 **7 Claims**



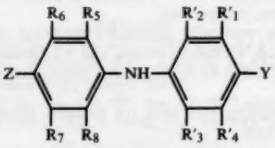
1. An insulating jacket enclosing a water-cooled pipe, said jacket comprising arcuate segments of pre-cast insulating material formed to include an aperture extending radially therethrough, an elongate metallic band held concentrically adjacent said pipe, an elongate projection having the inner end thereof attached to said metallic band and the outer end thereof adapted to extend radially outward through an aperture in a segment of said jacket, and means clasping the outer end of said projection to anchor the arcuate segments of insulating material between ends thereof whereby said jacket is held firmly to said pipe.

4,170,452
DYE COMPOSITION CONTAINING DIPHENYLAMINE AND POLYHYDROXYBENZENE

Jean-Francois Grollier, Paris; Christian Monnais, Neuilly-sur-Seine, and Chantal Fourcadier, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Jan. 18, 1977, Ser. No. 760,390
Claims priority, application France, Jan. 19, 1976, 76 01252
Int. Cl.[2] A61K *7/13*
U.S. Cl. 8—10.2 **16 Claims**

1. A hair dye composition comprising an aqueous solution of at least one diphenylamine having the formula



wherein

R'_1 and R'_4 each independently represent hydrogen, halogen, lower alkyl, lower alkoxy, acylamino or ureido;

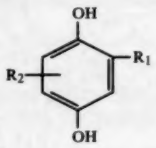
R'_2 and R'_3 each independently represent hydrogen, halogen, lower alkyl, lower alkoxy, amino, amino mono- or di-substituted by lower alkyl, N-hydroxy alkylamino, acylamino, N-carbamylalkylamino, ureido or N-carbalkoxyamino;

R_5, R_6, R_7 and R_8 each independently represent hydrogen, halogen, lower alkyl or lower alkoxy;

Y represents hydroxy or amino; and

Z represents hydroxy or

wherein R_9 and R_{10} each independently represent hydrogen, lower alkyl, hydroxyalkyl, carbamylalkyl, aminoalkyl, mono- or di-alkylaminoalkyl, acylaminoalkyl, alkylsulfonamidoalkyl, arylsulfonamidoalkyl, sulfoalkyl, piperidinoalkyl or morpholinoalkyl, or a salt thereof; and a polyhydroxybenzene or a salt thereof, said diphenylamine being a leucoderivative of an indoamine having an oxidation-reduction potential between −450 and −350 mv measured at a pH of 10 in a 25% ethanol solution in water, said polyhydroxybenzene or the salt thereof having an oxidation-reduction potential between −600 and −300 mv measured at a pH of 10 in water, and said polyhydroxybenzene having the formula



wherein

R_1 represents hydroxy or

wherein R_3 represents hydrogen or alkyl and

R_2 represents hydrogen, or NH_2 when R_1 represents NH_2; said diphenylamine being present in an amount sufficient to dye said keratinic fibers and said polyhydroxybenzene being present in an amount such that the ratio of the total moles of the diphenylamine to the number of moles of polyhydroxybenzene is between 2 and 7.

4,170,453
PEROXYACID BLEACH COMPOSITION

David J. Kitko, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 3, 1977, Ser. No. 803,107
Int. Cl.[2] C11D *3/395, 7/54*
U.S. Cl. 8—111 **2 Claims**

1. A method for bleaching nylon fabrics comprising contacting nylon fabrics to be bleached with a water solution containing an amount of the composition containing the following ingredients:

(a) from about 1% to about 60% of diperoxydodecanedioic acid, and

(b) from about 2% to about 90% of a buffering agent, wherein said acid and said buffering agent are present in the composition as separate granules and said buffering agent is present in an amount sufficient to maintain the pH of the water in which said acid is dissolved in the range of about 8.7 to about 9.5, and wherein said water solution contains a sufficient quantity of said composition to provide from about 15 ppm to about 45 ppm available oxygen.

4,170,454
PROCESS FOR THE PREPARATION OF A SOLID-PHASE RADIOIMMUNOASSAY SUPPORT AND USE THEREOF

Brigette Meriadec, La Grande Motte, and Patrice Roubertie, Montpellier, both of France, assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,650
Int. Cl.[2] G01N *33/16, 31/06*
U.S. Cl. 23—230.6 **7 Claims**

1. A process for the preparation of a solid-phase support useful in radioimmunoassay columns which support swells upon contact with an antigen-antibody-containing solution to conform to the shape of said columns, which process comprises the steps of:

(a) contacting in the liquid phase to provide a protein-bound gel of (i) at least one antisera and (ii) a chromatographic gel said protein-bound gel capable of selectively retaining one or more components contained in an antigen-antibody-containing solution,

(b) freeze-drying said protein-bound gel,

(c) subdividing said dried gel to a powder, and

(d) forming said powder into a solid-phase support.

7. In a radioimmunoassay wherein samples and reagents are mixed and transferred to chromatographic columns by means of centrifugal force, the improvement which comprises placing in said columns tablets prepared by the process of claim 1, and increasing said centrifugal force to an amount necessary to mix said samples and reagents and transfer them to the column containing said tablets, whereby said tablets swell and conform to the configuration of said columns.

4,170,455
GAS MONITORING METHOD AND APPARATUS THEREFOR

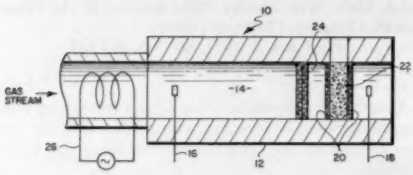
James O. Henrie, Hidden Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 11, 1976, Ser. No. 665,738
Int. Cl.[2] G01N *25/20, 31/10*
U.S. Cl. 23—232 R **12 Claims**

11. A method for monitoring a component of a gas stream comprising the sequential steps of:

(a) heating the gas stream to a desired temperature,

(b) introducing the gas stream into a single, axially extending, thermally insulated gas passageway,
(c) sensing the temperature of the heated gas stream,
(d) passing the gas stream through at least one perforate heat shield,
(e) passing the gas through a bed of particulate catalyst, which is spaced from said perforate metal shield,



(f) sensing the temperature of the gas exiting the catalyst bed,
(g) determining the concentration of the component of the gas stream as a function of the difference between the temperatures in steps (c) and (f), and
(h) discharging the gas stream from the thermally insulated gas passageway.

4,170,456

INHIBITING SPONTANEOUS COMBUSTION OF COAL CHAR

Robert H. Smith, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 22, 1978, Ser. No. 962,816
Int. Cl.[2] C10L *9/00*; C09C *1/56*
U.S. Cl. 44—1 F **6 Claims**

1. A method for inhibiting spontaneous combustion of coal char which comprises treating said char with air followed by carbon dioxide.

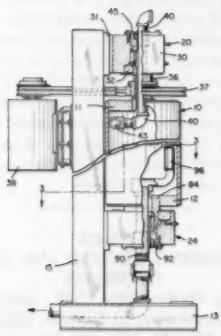
3. The method of claim **1** wherein said CO_2 treatment takes place at a temperature of from about 50° F. to about 300° F.

4,170,457

AIR SEPARATOR METHOD AND APPARATUS

Richard S. Tetro, Fulton, N.Y., assignor to The Black Clawson Company, Middletown, Ohio

Continuation of Ser. No. 734,287, Oct. 20, 1976, abandoned.
This application May 4, 1978, Ser. No. 902,938
Int. Cl.[2] B01D *19/02*; D21H *1/48*
U.S. Cl. 55—46 **3 Claims**



1. A method of removing entrained air from liquid paper coating material for subsequent application of such material to a moving web of paper by means of a coater having an inlet for liquid coating material, comprising the steps of providing a quantity of liquid coating material containing a quantity of entrained air bubbles therein, supplying said liquid coating material under a positive head of pressure to the interior of a tank-type rotating centrifugal separator and maintaining the separator in a substantially full condition, continuously removing said air laden coating material from a radially central region of said separator, continuously removing substantially air free coating material from a radially outer region of said separator, and conveying said air free coating material directly to said coater inlet without the imposition of intermediate pumping apparatus for application by said coater to a moving web of paper.

3. A separator for removing air bubbles and other entrained gas and air particles from a source of paper coating liquids under pressure, comprising:

a generally vertically oriented cylindrical tank having a closed top, a closed bottom, and a cylindrical side wall, and adapted to be operated in a substantially filled condition,

means mounting said tank for rotation about a generally vertical axis,

means in said tank top defining a coating liquid inlet positioned to deliver air laden coating liquid generally tangentially of the side wall of said tank adjacent the upper end thereof and in the direction of tank rotation,

coating supply conduit means connecting said source of coating liquid to said inlet for admitting coating into said tank under pressure from said source,

means in said tank defining a first outlet which extends through said tank top and which opens into said tank substantially at a central region thereof adjacent said top for extraction therefrom of separated air laden coating for return thereof to said supply,

means in said tank defining a second outlet having a liquid inlet orifice spaced axially from said tank bottom adjacent the side wall of said tank in non-rotating relation to said wall to intercept air free coating liquid for delivery thereof to a coater, and

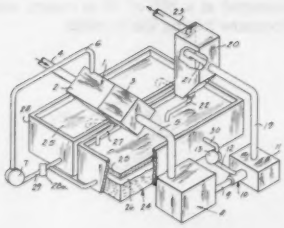
means for rotating said tank about said axis in the direction of flow of liquid from said coating liquid inlet to impart a corresponding rotation to the body of liquid within said tank.

4,170,458

SMOKE ELIMINATOR METHOD AND APPARATUS

George J. Hartwick, 3733 N. Sheridan Rd., Waukegan, Ill. 60085

Filed Oct. 25, 1977, Ser. No. 845,046
Int. Cl.[2] B01D *47/06*
U.S. Cl. 55—85 **16 Claims**



1. A device for the treatment of gaseous fluid containing particulates, comprising means forming a spray chamber having an inlet and an outlet for the fluid to be treated, and including water spray means through which such fluid is to be passed for at least partially removing particulates therefrom, means for receiving washed fluid discharged from said spray chamber and removing entrained water therefrom, power-driven compression means for receiving washed fluid from said entrained water-removing means and placing such fluid under pressure, means for receiving washed fluid under pressure from said

compression means and water under pressure, and intermixing the same, and means for receiving intermixed washed fluid and water from said intermixing means for separating water from such intermixture.

10. A method of treating gaseous fluid containing particulants, comprising the steps of passing such gaseous fluid through a water wash spray, separating the water and accumulations therein from the washed fluid remaining after said separation, compressing said remaining fluid to a pressure of between 20 and 40 pounds, thereafter intermixing the latter under pressure with water, separating the intermixed fluid from the water, and exhausting said separated fluid discharge.

4,170,459

METHOD FOR COLLECTING GLASS FIBERS

John E. Myers, Anderson, S.C., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 761,097, Jan. 21, 1977, abandoned. This application Jun. 8, 1978, Ser. No. 913,768

Int. Cl.[2] C03B *37/02*

U.S. Cl. 65—3 R **5 Claims**

1. In a process for collecting an array of split strand fibers in which fibers are attenuated from a bushing containing molten material, a strand of the fibers is passed into contact with a size applicator surface, thereby producing a frictional drag force, a strand splitter is inserted into said strand to produce an array of split strand fibers, and said array of split strand fibers is collected as a package, the improvement comprising increasing the frictional drag force produced by contact with said size applicator surface prior to the insertion of said strand splitter said frictional drag force being sufficient to reduce the dancing effect made by the fibers and to allign the fibers, and re-establishing the frictional drag force subsequent to the insertion of said strand splitter.

4,170,460

METHOD OF MAKING COLORED GLASS ARTICLES

Harold E. Donley, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 697,310, Jun. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 544,081, Jan. 27, 1975, abandoned. This application Oct. 25, 1977, Ser. No. 845,102

Int. Cl.[2] C03C *17/00*

U.S. Cl. 65—30 R **10 Claims**

1. A method for making a colored glass article comprising the steps of:

a. contacting a surface of a glass substrate with a metal selected from the group consisting of gold, silver, platinum, palladium, copper, nickel and mixtures thereof at a sufficiently high temperature and for a sufficient time to provide for migration of the metal into the contacted surface to produce a metal-modified glass portion immediately subjacent the metal-contacted surface having a refractive index sufficiently different from the refractive index of the unmodified portion of the glass substrate; to impart color to the glass substrate and

b. contacting the colored metal-modified surface of the substrate with a coating composition containing a metal compound at a sufficiently high temperature to convert the metal compound to a metal oxide coating by thermal reaction on contact with the glass substrate.

4,170,461

HEAT TREATMENT OF ELECTROLESSLY DEPOSITED CUPROUS OXIDE COATING

J. Shannon Breininger, Gibsonia, and Charles B. Greenberg, Murrysville, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 29, 1976, Ser. No. 755,371

Int. Cl.[2] C03C *17/00, 25/02*

U.S. Cl. 65—60 D **4 Claims**

1. In a wet chemical method for directly depositing cuprous oxide onto a receptive surface of a nonmetallic substrate comprising contacting the receptive surface with a solution of copper salt, reducing agent and sufficient alkali to raise the pH of the solution above about 12.9 to deposit a film consisting essentially of cuprous oxide on the surface, the improvement which comprises subsequently heating the cuprous oxide coated article at a temperature of at least about 300° F. but below the melting point of the substrate.

4,170,462

METHOD FOR CONTROLLING THE RELATIVE STEM GROWTH OF PLANTS

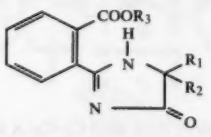
Thomas D. O'Neal, Princeton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 23, 1978, Ser. No. 871,874

Int. Cl.[2] A01N *5/00*

U.S. Cl. 71—76 **9 Claims**

1. A method for controlling the relative stem growth of plants comprising applying to the foliage, stems, roots or seeds of said plants or to soil in which said plants are grown, a plant growth regulating amount of a compound having the formula:



wherein R_1 is methyl; R_2 is isopropyl; R_3 is alkyl C_1–C_{12}, alkenyl C_3–C_5 optionally substituted with one chlorine or one or two methyl substituents, alkynyl C_3–C_5 optionally substituted with methyl, benzyl, cyclohexenylmethyl, or pentadienyl; and the acid addition salts thereof.

4,170,463

2,6-DIALKYL-N-DIALKYLPHOSPHONOMETHYL CHLOROACETANILIDES AS HERBICIDES

George B. Large, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

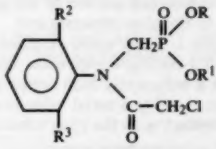
Filed Apr. 7, 1978, Ser. No. 894,445

Int. Cl.[2] A01N *9/36*

U.S. Cl. 71—86 **21 Claims**

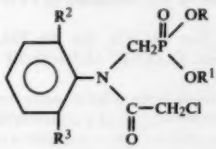
1. A method of controlling undesirable vegetation which comprises applying to the area where control of said vegeta-

tive growth is desired, a growth controlling amount of a compound having the formula



wherein R and R^1 are both methyl or both ethyl, R^2 is methyl or ethyl and R^3 is methyl or ethyl.

9. Compounds of the following structural formula



wherein R and R^1 are both methyl or both ethyl, R^2 is methyl or ethyl and R^3 is methyl or ethyl.

4,170,464

HERBICIDAL COMBINATIONS

Richard W. Feeny, Hightstown, N.J., assignor to American Cyanamid Company, Stamford, Conn.

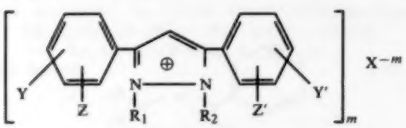
Continuation-in-part of Ser. No. 518,020, Oct. 25, 1974, abandoned, which is a division of Ser. No. 307,670, Nov. 17, 1972, Pat. No. 3,867,403. This application Aug. 8, 1977, Ser. No. 822,504

Int. Cl.[2] A01N *9/22*

U.S. Cl. 71—92 **11 Claims**

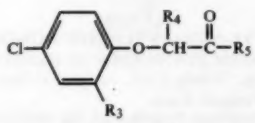
1. A snyergistic herbicidal combination for the simultaneous control of wild oat and broadleaf weeds comprising a herbicidally effective amount of

(a) a 1,2-dialkyl-3,5-diphenylpyrazolium salt of the formula

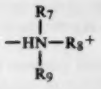


wherein R_1 is methyl; R_2 is alkyl C_1–C_4; X is a chloride, bromide, iodide, acetate, hydroxide, hydrogen sulfate, methyl sulfate, p-toluene sulfonate or perchlorate anion, Y, Y', Z, and Z' are hydrogen, halogen, methyl or methoxy; and m is 1; provided that only one phenyl ring can be substituted on the carbon para to the pyrazolium ring with a substituent other than hydrogen; and

(b) a phenoxyacetic acid, ester or salt, of the formula:



wherein R_3 is Cl or methyl; R_4 is hydrogen or methyl; R_5 is —OR_6 or —OM; R_6 is hydrogen, alkyl C_1–C_8, or alkoxyalkyl C_2–C_8; and M is an alkali metal ion,



or —$NH^+(H)_n(R_{10}OH)_{n'}$; R_7, R_8 and R_9 are hydrogen or alkyl C_1–C_4; R_{10} is alkylene C_1–C_4; n is an integer 0,1 or 2; n' is an integer 1, 2 or 3 and the sum of n and n' is 3; or mixtures of the acid, ester or salt, said amount being sufficient to provide from about 0.25 to 2.0 pounds per acre of the pyrazolium cation and from about 0.13 pound to 1.0 pound per acre of the halophenoxy compound when applied in the field.

4,170,465

NOVEL CROTONAMIDES

Jacques Perronnet, and Pierre Girault, both of Paris, France, assignors to Roussel UCLAF, Paris, France

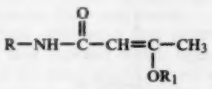
Filed Apr. 16, 1975, Ser. No. 568,383

Claims priority, application France, Apr. 22, 1974, 74 13891

Int. Cl.[2] A01N *9/20;* **C07C** *103/60*

U.S. Cl. 71—118 **18 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of adamantyl, bornyl, 5',6'-dihydroendo-5'-dicyclopentadienyl and cycloalkyl of 3 to 8 carbon atoms optionally substituted with a member of the group consisting of alkyl of 1 to 6 carbon atoms, hydroxy and chlorine, cycloalkenyl of 3 to 8 carbon atoms, and R_1 is alkyl of 1 to 3 carbon atoms.

4,170,466

WATER ATOMIZED COPPER ALLOYS

Erhard Klar, Beachwood, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Oct. 11, 1978, Ser. No. 950,381

Int. Cl.[2] B22D *23/08*

U.S. Cl. 75—0.5 C **4 Claims**

1. An explosion-free water atomization process for atomization of molten copper alloys to produce fine particle size copper alloy powders, the improvement comprising:

providing a copper alloy consisting of by weight at least 50% copper alloyed with at least 0.1% silicon and an oxidizable metal selected from manganese, chromium, or zirconium, said silicon level being between about 0.1% and 4%; and water atomizing said alloy to provide copper alloy particles substantially free of oxides and with a surface silicon dioxide film.

4,170,467

METHOD FOR PRODUCING HIGH CHROMIUM STEELS HAVING EXTREMELY LOW CARBON AND NITROGEN CONTENTS

Hiroyuki Kaito, Takarazuka; Takashi Ohtani; Shoji Iwaoka, both of Ashiya; Yukio Oguchi, Chiba; Shuya Yano, Chiba, and Akio Ejima, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jan. 27, 1978, Ser. No. 872,992

Claims priority, application Japan, Jan. 31, 1977, 52-8713

Int. Cl.[2] C21C *7/10;* **C22C** *33/00*

U.S. Cl. 75—49 **4 Claims**

1. A method for producing high chromium steels having extremely low carbon content of not more than 0.0030% and extremely low nitrogen content not more than 0.0040% using vacuum ladle decarburization apparatus, which comprises

transferring to a ladle a high chromium molten steel containing 10 to 35% of Cr, 0.8 to 2.5% of C and not more than 0.06% of N, which is melted in a steel making furnace, putting the ladle in a vacuum tank, then under reduced pressure blowing more than 15 and up to 40 N/min per ton of the molten steel of an inert gas into the molten steel from bottom of the ladle and concurrently blowing 12 to 30 Nm^3/hr per ton of the molten steel of oxygen gas to the molten steel surface, terminating the oxygen blowing when the carbon concentration in the molten steel becomes not more than 0.020%, and subsequently under a high vacuum of not more than 10 torr. blowing 6 to 40 N/min per ton of the molten steel of an inert gas to contact the molten steel with a slag of 1–100 kg per ton of the molten steel which contains not less than 20% of SiO_2 and not more than 25% of Cr_2O_3.

4,170,468

DEOXIDATION OF STEEL

Lester J. Regitz, Penn Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 22, 1977, Ser. No. 863,115
Int. Cl.[2] C21C *7/06*
U.S. Cl. 75—58 **23 Claims**

1. A method of deoxidizing molten steel to minimize finely-dispersed non-metallic inclusions therein, comprising while the steel is being tapped into a receiving vessel, sequentially adding to the steel in the receiving vessel at least three different deoxidizing elements in order of increasing deoxidizing strength in a combined amount sufficient to deoxidize said steel, said additions spaced by sufficient time intervals to permit each addition to mix and react with oxygen and oxides therein.

4,170,469

ALUMINUM BASE BEARING ALLOY AND A COMPOSITE BEARING MADE OF THE ALLOY WITH A STEEL BACKING PLATE

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Filed Feb. 22, 1978, Ser. No. 879,977
Claims priority, application Japan, Aug. 9, 1977, 52-95354
Int. Cl.[2] C22C *21/02*; B21D *53/10*
U.S. Cl. 75—141 **10 Claims**

1. An aluminum-base bearing alloy of superior anti-sticking property and fatigue strength consisting of 2–8% by weight of zinc, 2–8% by weight of silicon, 0.1–3% by weight of copper, 0.1–3% by weight of lead and the remainder substantially aluminum, said zinc existing as a solute metal in aluminum solid solution, and said silicon and lead existing as dispersed particles.

4,170,470

HIGH STRENGTH LEAD ALLOY

Dennis L. Marshall, Wauwatosa, and Anthony Matuszewski, Milwaukee, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Continuation of Ser. No. 658,889, Feb. 18, 1976, abandoned. This application Nov. 23, 1977, Ser. No. 854,256
Int. Cl.[2] C22C *11/02, 11/04, 11/06*
U.S. Cl. 75—166 D **36 Claims**

1. An alloy for use as a battery plate grid in a lead-acid battery, comprising, by weight:

strontium	0.01%–about 0.3%
tin	0.1%–5.0%
aluminum	0.005%–0.1%
copper	0.0%–0.25%
lead	balance

4,170,471

SILVER ALLOYS FOR METALLIZATION OF MAGNETIC BUBBLE DOMAIN DEVICES

Robert F. Bailey, Los Alamitos, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 27, 1978, Ser. No. 928,488
Int. Cl.[2] C22C *5/00*
U.S. Cl. 75—173 C **2 Claims**

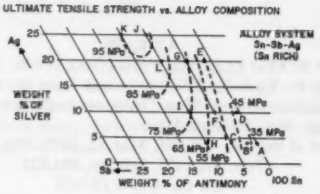
1. A high conductivity, low migration rate metallic alloy for use in magnetic bubble domain structures comprising
a host material of silver, and
a dopant comprising 1% to 6% (atomic) and taken from the class comprising In, Mn, Bi, Cr, Pb, Cu, Be.

4,170,472

SOLDER SYSTEM

Dennis R. Olsen, and Keith G. Spanjer, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 19, 1977, Ser. No. 788,954
Int. Cl.[2] C22C *13/00*
U.S. Cl. 75—175 A **4 Claims**



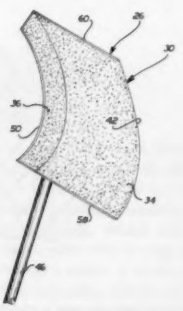
1. A solder composition for metallurgically bonding a metal backed semiconductor die to a metal package member, said solder composition compatible with and capable of wetting the metal backing of said metal backed semiconductor die, said composition comprising 61 to 69 weight percent tin, 8 to 11 weight percent antimony and 23 to 28 weight percent silver.

4,170,473

METHOD OF MAKING AND USING A WELDING CHILL

John M. Gerken, Chagrin Falls, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 13, 1978, Ser. No. 869,285
Int. Cl.[2] B22F *5/00*; B23K *9/00*
U.S. Cl. 75—208 R **11 Claims**



1. A method comprising the steps of providing a part which is to be welded on one side while a surface area on an opposite side is chilled, covering the surface area to be chilled with a body of powdered metal, sintering the body of powdered metal while it is in engagement with the surface area to be chilled to form a metal chill member, pressing the sintered

metal chill member against the surface area to be chilled, and welding the part while performing said step of pressing the metal chill member against the surface area to be chilled.

5. A method comprising the steps of forming a gas pervious chill member, pressing the gas pervious chill member against a surface area of a metal part, welding the metal part opposite the surface area against which the chill member is being pressed, and conducting an inert gas through the chill member to the surface area against which the chill member is being pressed while performing said step of welding the metal part.

4,170,474

POWDER METAL COMPOSITION

Yew-Tsung Chen, Stamford, Conn., assignor to Pitney-Bowes, Stamford, Conn.

Filed Oct. 23, 1978, Ser. No. 953,361
Int. Cl.[2] C22C *33/02, 38/42, 38/44*
U.S. Cl. 75—251 **3 Claims**

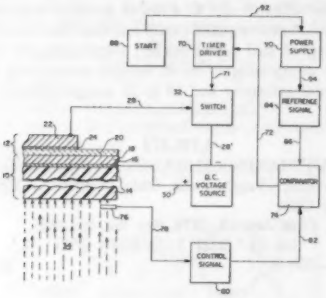
1. A powder metal composition comprising:
1.0–2.5% Ni, 0.3–0.7 Mo, 0.15–0.30 Mn, 0.5–1.5% Cu, 0.3–0.7 C, 0.50–1.0% zinc stearate, the balance being Fe.

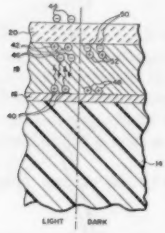
4,170,475

HIGH SPEED ELECTROPHOTOGRAPHIC METHOD

Manfred R. Kuehnle, Lexington, and Arno K. Hagenlocher, Framingham, both of Mass., assignors to Coulter Information Systems, Inc., Bedford, Mass.

Division of Ser. No. 796,054, May 12, 1977. This application Nov. 16, 1977, Ser. No. 851,821
Int. Cl.[2] G03G *13/056*
U.S. Cl. 96—1 C **8 Claims**





1. A method of producing a charge image of a pattern of radiant energy and making the same available for utilization upon a multilayer sandwich of materials consisting of a substrate having a thin film layer of ohmic material bonded to one surface and a thin film layer of crystalline, sputter-deposited wholly inorganic, dense, highly ordered and oriented crystallite, substantially panchromatic photoconductor material bonded to said ohmic layer and a thin film layer of dielectric material bonded to the photoconductive layer, which comprises:

A. overlaying an electrode onto the layer of dielectric material and interposing a conductive film material between the electrode and dielectric layer to establish an intimate bond therebetween,

B. applying a low voltage source of d.c. between the ohmic layer and the electrode for a predetermined period of time,

C. projecting the radiant energy pattern onto the photoconductive layer for the time that said connection is established whereby to release carriers from the photoconductive layer to effect the synthesization of a latent charge image of said pattern on the dielectric layer and

D. removing the electrode and conductive film to uncover the dielectric layer.

2. The method as claimed in claim 1 in which the conductive film comprises a liquid of conductive material captured between the electrode and the layer of dielectric material and in the process of overlaying and interposing, the liquid is applied.

4,170,476

LAYERED PHOTOCONDUCTIVE ELEMENT HAVING AS AND/OR TE DOPED WITH GA, IN OR TL INTERMEDIATE TO SE AND INSULATOR

Shigeru Sadamatsu, and Kozo Oka, both of Minami-ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,925
Claims priority, application Japan, Jun. 30, 1976, 51-77265
Int. Cl.[2] G03G *5/09*
U.S. Cl. 96—1.5 N **10 Claims**

1. A photosensitive element for electrophotography comprising a support having thereon a photoconductive layer and an electrically insulating layer thereon on the surface thereof remote the support, in which the photoconductive layer is a vacuum-deposited film substantially comprising Se with a surface layer portion thereof contacting the electrically insulating layer containing, within a thickness of about 10μ or less, about 1 to about 50% by weight of As and/or Te and about 0.5 to about 1000 pm of at least one element selected from the group consisting of Ga, In, Tl of a mixture thereof.

4,170,477

METHOD FOR MAKING POLYSULFUR NITRIDE AND PRODUCT THEREOF

Peter Love, and Mortimer M. Labes, both of Philadelphia, Pa., assignors to Temple University, Philadelphia, Pa.

Filed Jun. 5, 1978, Ser. No. 912,481
Int. Cl.[2] B05D *3/06*
U.S. Cl. 96—36.2 **11 Claims**

1. In the method of making $(SN)_x$ consisting of thermally decomposing S_4N_4 in the presence of silver wool, collecting the products thereof and holding said products at a sufficiently high temperature a sufficient period of time to permit substantially complete polymerization thereof, the improvement consisting of irradiating at least a fraction of said collected S_4N_4 decomposition products with radiation in the γ ray to visible light range at an intensity sufficient to enhance the initiation of polymerization of said irradiated products.

7. An improved method, as recited in claims 1, 2 or 3, wherein said products to be irradiated are disposed as a coating on a substantially inert electrically non-conductive substrate therefor and preselected portions of said coating are masked to prevent irradiation thereof, the unmasked portions being irradiated and polymerized as claimed.

11. A product consisting of an electrically non-conductive substrate having disposed thereon in a preselected pattern, an electrically conductive coating, said product having been produced by a process as recited in claim 7.

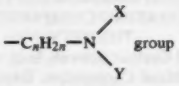
4,170,478
PHOTOGRAPHIC COLOR DEVELOPER COMPOSITIONS

Nelson S. Case, and Danny L. Wyatt, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 804,045, Jun. 6, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 884,086
Int. Cl.[2] G03C *5/30*
U.S. Cl. 96—66.4 **39 Claims**

1. A photographic color developing composition comprising (1) a primary aromatic amino color developing agent, (2) an hydroxylamine and (3) a member selected from the group consisting of (a) alkanolamines which are free of carboxyl substitution, and are represented by the formula

wherein R_1 is an hydroxyalkyl group of 2 to 6 carbon atoms and each of R_2 and R_3 is a hydrogen atom, an alkyl group of 1 to 6 carbon atoms, an hydroxyalkyl group of 2 to 6 carbon atoms, a benzyl radical, or a



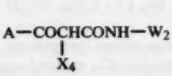
wherein n is an integer of from 1 to 6 and each of X and Y is a hydrogen atom, an alkyl group of 1 to 6 carbon atoms or an hydroxyalkyl group of 2 to 6 carbon atoms, (b) aliphatic monoamino monocarboxylic acids of up to 3 carbon atoms, and (c) aminobenzoic acids; the concentration of (2) and (3) being sufficient to retard aerial oxidation of said primary aromatic amino color developing agent.

4,170,479
MULTI-LAYER COLOR LIGHT-SENSITIVE MATERIAL

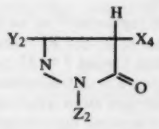
Toshimasa Usami, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 8, 1976, Ser. No. 647,544
Claims priority, application Japan, Jan. 8, 1975, 50-5179
Int. Cl.[2] G03C *1/76, 3/00, 7/00*
U.S. Cl. 96—68 **22 Claims**

1. A multi-layer color light-sensitive material comprising at least one silver halide emulsion layer which comprises at least two unit emulsion layers, one of which is a relatively more sensitive unit emulsion layer and one of which is a relatively less sensitive unit emulsion layer, the at least two unit emulsion layers being sensitive to the same spectral region, wherein the less sensitive unit emulsion layer contains a slow coupling coupler and the more sensitive unit emulsion layer contains a rapid coupling coupler and a slow coupling coupler in an amount of from about 20 to about 90 mol% based on the total coupler amount in the more sensitive unit emulsion layer, where the less sensitive unit emulsion layer and/or the more sensitive unit emulsion layer further contains a development inhibitor-releasing (DIR) coupler and/or a development inhibitor-releasing (DIR) compound in an amount of from about 0.1 to about 40 mol% based on the total coupler amount in the more sensitive unit emulsion layer and/or the less sensitive unit emulsion layer, said development inhibitor-releasing (DIR) coupler being represented by general formulae (VII), (VIII) or (IX):

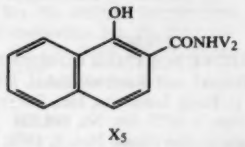


wherein A represents an aryl group, a tert-alkyl group or a substituted 1,1-dialkylmethyl group, W_2 represents a substituted aryl group, and X_4 represents a group eliminated upon coupling to diffuse as a development inhibitor;



(VIII)

wherein Y_2 represents an alkyl group or a substituted amino group, Z_2 represents an aryl group, a substituted aryl group, an aralkyl group or a substituted aralkyl group and X_4 represents a group eliminated upon coupling to diffuse as a development inhibitor; and



(IX)

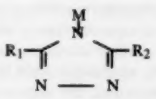
wherein V_2 represents a substituted aryl group, a substituted aryloxy alkyl group or an alkyl group and X_5 represents a group capable of being eliminated upon coupling to diffuse as a development inhibitor.

4,170,480
THERMALLY DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Shinpei Ikenoue; Takao Masuda; Harumi Katsuyama; Nobuyoshi Sekikawa, all of Asaka; Tadao Shishido, and Nobuo Sakai, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 7, 1977, Ser. No. 831,315
Claims priority, application Japan, Sep. 7, 1976, 51-107017
Int. Cl.[2] G03C *1/02, 1/34*
U.S. Cl. 96—114.1 **9 Claims**

1. A thermally developable light-sensitive material comprising a support having therein or in at least one layer thereon (a) an organic silver salt, (b) a light sensitive silver halide or a component capable of forming a light sensitive silver halide upon reaction with said organic silver salt (a), and (c) a reducing agent, and additionally (d) at least one 1,2,4-triazole compound represented by the following formula (I):



(I)

wherein M represents a hydrogen atom or an alkali metal atom and R_1 and R_2, which may be the same or different, each represents a halogen atom, a nitro group or a carbon-containing substituent selected from the group consisting of an alkyl group having 1 to 18 carbon atoms, which may be straight chain, branched chain or cyclic and which may be substituted with one or more of a halogen atom, a hydroxyl group, a carboxyl group or a carbon-containing substituent having 1 to 12 carbon atoms; an aryl group having 6 to 18 carbon atoms which may be monocyclic or bicyclic and which may be substituted with one or more of a halogen atom, a nitro group, a hydroxy group, a carboxy group or a carbon-containing substituent having 1 to 12 carbon atoms; a substituted oxy group, a substituted thio group, a substituted sulfinyl group, a substituted sulfonyl group or a substituted amino group having the general formulas, respectively:

R′—O—
R′—S—
R′—SO_2—
R′—SO_3—
R′$_n$—NH_m— or R″=N—

wherein n and m each represents 0 or an integer of 1 to 2, where n+m is equal to 2, and R′ represents a carbon-containing substituent having 1 to 12 carbon atoms and wherein R″ represents a 5- or 6-membered heterocyclic ring containing a nitrogen atom which may form a fused ring together with a benzene nucleus and which may be substituted with one or more alkyl groups having 1 to 4 carbon atoms; or a 5- or 6-membered heterocyclic ring which may form a fused ring together with a benzene ring and which may be substituted with one or more alkyl groups having 1 to 4 carbon atoms;

wherein said component (d) is added after formation of a mixture of said component (a) and component (b).

4,170,481
PHOTOSENSITIVE POLYMER COMPOSITION

Tadashi Akama, Okazaki, and Kuniyuki Sakai, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 7, 1977, Ser. No. 848,938
Claims priority, application Japan, Nov. 8, 1976, 51-133265
Int. Cl.[2] G03C *1/68;* **C08K** *5/00;* **C08L** *5/00*
U.S. Cl. 96—115 P **12 Claims**

1. A photosensitive polymer composition comprising:

(1) a photohardenable composition comprising a soluble polymer selected from the group consisting of:

(a) a soluble polymer and photopolymerizable ethylenically unsaturated compound(s), or

(b) a soluble polymer having photopolymerizable ethylenically unsaturated groups in the polymer chain, and

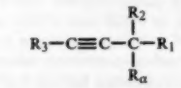
(2) about 0.001 to 10 parts, by weight, per 100 parts, by weight, of (1)(a) or (1)(b) of a member selected from the group consisting of the ascorbic acids and their derivatives, said member comprising either an ascorbic acid, ascorbic acid ester, or ascorbic acid salt moiety and being adapted to provide stability to heat and storage for said photohardenable composition of (1)(a) or (1)(b).

4,170,482
JET PRINTING INK COMPOSITION CONTAINING AN ACETYLENIC COMPOUND AND A LACTONE

Ishwar R. Mansukhani, Neenah, Wis., assignor to M & T Chemicals Inc., Stamford, Conn.

Filed Sep. 8, 1978, Ser. No. 940,501
Int. Cl.[2] C09D *11/02*
U.S. Cl. 106—20 **25 Claims**

1. In a process for information recording comprising producing a fine jet of colored aqueous liquid, directing the jet of colored liquid onto a recording medium, modulating the density of the applied jet by an electric field in accordance with the information to be recorded, the improvement comprising the presence as a humectant consisting of the combination of at least one water-soluble acetylenic compound selected from α-substituted acetylenic compounds exhibiting the structural formula:



in which each of R_1 and R_2 may be substituents selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, hydroxy-substituted and alkoxy-substituted alkyl, alkenyl, and alkynyl groups, and R_1 and R_2 may together be a carbonyl oxygen; R_3 may be a substituent of the group consisting of hydrogen, halogen, alkyl, alkenyl, alkynyl, hydroxy-substituted and alkoxy-substituted alkenyl and alkynyl groups, and substituted-alkyl groups having the formula:

in which each of R_4 and R_5 may be substituents selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, and hydroxy-substituted and alkoxy-substituted alkyl, alkenyl, and alkynyl groups, and when R_1 and R_2 together are carbonyl oxygen, R_3 may be an aryl group, including hydroxy and alkoxy and alkyl-substituted aryl; each of R_α and $R_{\alpha'}$ may be substituents selected from the group consisting of hydroxy, alkoxy, carboxy-substituted alkoxy, formoxy, alkanoxy, halogen and polyoxy groups and the internal anhydride of at least one carboxylic acid selected from the group consisting of the lactones of fatty acids, the lactones of alicyclic acids, the lactones of acetylenic acids, and the lactones of aromatic acids in a ratio of 90:1 of the former to 1:90 of the latter.

4,170,483
PROCESS FOR THE PRODUCTION OF SELF-CONTAINED CARBONLESS COPY RECORD SHEETS AND COATING COMPOSITION FOR USE THEREIN

Dale R. Shackle, and Gerhart Schwab, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 608,768, Aug. 28, 1975. This application Jul. 30, 1976, Ser. No. 710,201
Int. Cl.[2] C09D *11/00*
U.S. Cl. 106—21 **6 Claims**

1. An aqueous slurry for coating pressure-sensitive record sheets, said aqueous slurry including:

(a) a plurality of microcapsules, said microcapsules containing a solution of a color precursor in an oil carrier, said color precursor in said oil carrier being capable of forming a color with a color developer without heating to an elevated temperature, said microcapsules having walls comprising a reaction product of a wall forming compound and a cross-linking agent; wherein said wall forming compound is hydroxypropylcellulose and said cross-linking agent is selected from the group consisting of polyfunctional isocyanates, acyl chlorides, phosphonyl chlorides, sulfonyl chlorides, alkylene bischloroformates and mixtures thereof;

(b) a solid particulate color developer for said color precursor; and

(c) a color suppressant comprising a nitrogen containing basic organic compound selected from the group consisting of: amines, polyethylenimines and aziridines, said color suppressant being present in said aqueous slurry in an amount of from about 0.1 percent to about 5.0 percent based on the dry weight of said slurry, said amount being sufficient to substantially prevent color formation between said color developer and any unencapsulated solution of said color precursor in said oil carrier.

4,170,484
BITUMINOUS-EMULSION MINERAL AGGREGATE COMPOSITIONS

Wheeler C. Crawford, Houston, and James R. Wilson, Missouri City, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 12, 1978, Ser. No. 895,698
Int. Cl.[2] C08L *95/00*
U.S. Cl. 106—281 N **7 Claims**

1. A surfacing composition comprising

(a) 100 parts by weight of a mineral aggregate,

(b) the residuum of from 3 to 150 parts by weight of an asphalt emulsion comprising: (A) about 40 to about 85

percent by weight of asphalt, (B) from about 0.5 to about 10.0 percent by weight of a water-soluble alkoxylated asphalt emulsifier and (C) water to make 100 percent by weight of the emulsion and wherein the said aggregate is treated with a silane adhesion promoter in an amount such that a residual concentration of the said silane on the aggregate is about 0.001 to about 0.02 weight percent.

3. The surfacing composition of claim 1 wherein the said silane is selected from the group consisting of β-aminoethyl-γ-aminopropyl trimethyoxysilane and γ-aminopropyl triethoxysilane.

4,170,485

TITANIUM DIOXIDE SLURRIES FROM RECYCLE MATERIAL

David W. Blake; Gerard M. Sheehan; John D. Rowland, and George L. Roberts, all of Savannah, Ga., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 22, 1978, Ser. No. 935,817

Int. Cl.² C09C *1/36*

U.S. Cl. 106—300 **5 Claims**

1. A high gloss titanium dioxide slurry comprising:

60–80% by weight thickener underflow material as the titanium dioxide, the underflow being the bottom product out of a milling step in which the particles are considered too fine to be packed as a dry pigment;

0.3–2% by weight organic polyelectrolyte dispersant; and the balance is water.

4,170,486

CARBON BLACK COMPOSITIONS AND BLACK-PIGMENTED COMPOSITIONS CONTAINING SAME

Leonard H. Doppler, Lexington, Mass., assignor to Cabot Corporation, Boston, Mass.

Filed May 5, 1975, Ser. No. 574,548

Int. Cl.² C09C *1/48*

U.S. Cl. 106—307 **15 Claims**

1. A coating composition comprising:

(A) a solvent-reduced vehicle containing between 10 to 60% by weight of a film forming resinous binder solute;

(B) between about 0.1 and about 20% by weight of the total composition of a carbon black pigment having a volatile content of at least about 4% by weight; and

(C) an organic acid salt of a metal chosen from the group consisting of iron, zirconium and mixtures thereof, said salt being present in an amount sufficient to provide between about 0.05 and 3%, as metal, by weight of the carbon black pigment.

4,170,487

PROCESS FOR GRANULATING PIGMENT COMPOSITIONS

George H. Robertson, Cincinnati, Ohio; Robert L. Rooney, Beith, and Robert B. Todd, Paisley, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 24, 1978, Ser. No. 889,678

Claims priority, application United Kingdom, Nov. 18, 1977, 48062/77

Int. Cl.² C09C *3/08*

U.S. Cl. 106—309 **14 Claims**

1. A process for producing a pigment or dyestuff composition in the form of dustless readily-dispersible granules which comprises contacting, with agitation, (1) an aqueous dispersion of a pigment, (2) a protective colloid, (3) an aliphatic or araliphatic amine which is liquid at temperatures below 100° C., insoluble in water at pH values above 7, and soluble in water at pH values below 7, and (4) an organic carrier which has a melting point above 40° C. and which is soluble in, or at least softened by the amine and is insoluble or can be rendered insoluble in water throughout the pH range used in the process, the pH value being first above 7, maintaining the temperature above the melting point of the amine compound, stirring at least until the pigment has migrated from the aqueous phase to the organic phase consisting of the protective colloid and the amine, and then reducing the pH to below 7 to render the amine compound soluble in water, and recovering the resulting granules in a solvent-free condition.

4,170,488

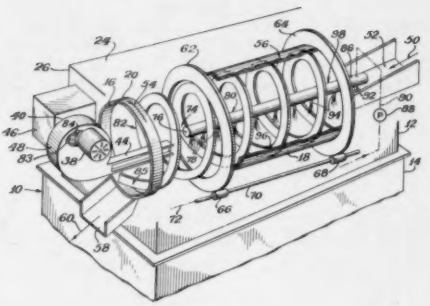
ENVIRONMENTAL, SMALL-PART CONTINUOUS WASHING PROCESS

Maurice Norman, Woodstock, Ill., assignor to J. S. Mannor Machine Corporation, Woodstock, Ill.

Division of Ser. No. 493,077, Jul. 30, 1974, Pat. No. 4,098,225. This application Jun. 27, 1977, Ser. No. 810,043

Int. Cl.² B08B *7/04, 5/00*; B67C *1/00*

U.S. Cl. 134—10 **10 Claims**



1. A continuous washing and rinsing process comprising a substantially closed chamber for parts in manufacture, utilizing a hot, wash water collecting tank receiving, for recycling, condensate rinse and liquid spray run off from the process, and utilizing a compression section drawing in the steaming air from within the closed chamber for recycling, said tank included in a liquid path effecting pressure spray impingement on said parts undergoing the continuous process, said compression section included in a hot air path producing wet air by compression condensation of steam in air, and thereafter directing onto said parts blown wet air, maintaining the wash water in the collecting tank at a predetermined steaming temperature range, and reintroducing the blown condensed water into the heated tank for recycling.

4,170,489

PROCESS FOR CLEANING JET ENGINE NOZZLES

Harve W. Magnus, Manhattan Beach, Calif., and Vincent J. Masur, Kansas City, Mo., assignors to Teledyne Sprague Engineering Division of Teledyne, Inc., Gardena, Calif.

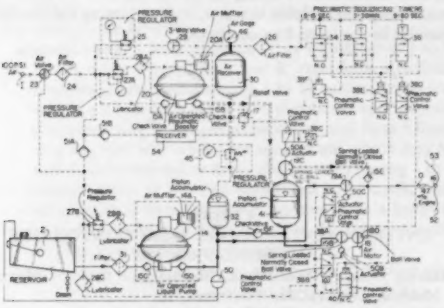
Division of Ser. No. 841,008, Oct. 11, 1977. This application Jul. 24, 1978, Ser. No. 927,552

Int. Cl.² B08B *9/00*

U.S. Cl. 134—22 R **6 Claims**

1. A process for cleaning the fuel nozzles and guide vanes of

jet engines, and the like, which comprises disconnecting the fuel system of the engine from the fuel nozzles; introducing a



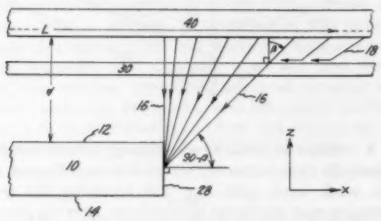
pressurized stream of cleaning solution into the fuel nozzles to be emitted through the fuel nozzles.

4,170,490

PROCESS FOR THERMAL GRADIENT ZONE MELTING UTILIZING A BEVELED WAFER EDGE

Thomas R. Anthony, Schenectady, N.Y., and Harvey E. Cline, Stanford, Calif., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 7, 1978, Ser. No. 967,343
Int. Cl.[2] H01L *21/225*
U.S. Cl. 148—1.5 **9 Claims**



1. In an improved method for processing semiconductor wafers by thermal gradient zone melting comprising the steps of

a. providing a radiant heat source having a lateral dimension L;

b. selecting a body of single crystal semiconductor material so that the body has a first type conductivity, a selected level of resistivity, an outer side peripheral surface, two major opposed substantially parallel surfaces which are the top and bottom surfaces thereof, and at least one major surface having a preferred planar crystal structure orientation which is one selected from the group consisting of **(100)**, **(110)** and **(111)**, and a vertical axis of the body being substantially aligned at a predetermined angle with a first axis of the crystal structure;

c. the surface having the preferred planar crystal structure orientation to accommodate one or more physical configurations of a layer of metal thereon;

d. depositing a layer of metal on the selected surface of the body of semiconductor material;

e. disposing the body a predetermined distance d from the radiant heat source;

f. heating the body and the metal deposited to a temperature sufficient to form a melt of metal-rich material on the surface of the body;

g. establishing a temperature gradient along substantially the vertical axis of the body and the first axis of the crystal structure, and

h. migrating the metal-rich melt through the body along the first axis of the crystal structure to divide the body into a plurality of regions of first type conductivity and to form at least one array of regions of recrystallized material of the body having solid solubility of the vapor deposited metal therein, the metal including at least one dopant impurity material therein to impart a second and opposite type conductivity and a selected level of resistivity thereto,

the improvement consisting of beveling the outer side peripheral surface at a predetermined included angle α with the bottom surface of the body, in order that the radiant heat impinging on the beveled side peripheral surface is equal to the radiant heat emitted by the beveled side peripheral surface of the body.

4,170,491

NEAR-SURFACE THERMAL GRADIENT ENHANCEMENT WITH OPAQUE COATINGS

Harvey E. Cline, Schenectady; Douglas E. Houston, Ballston Lake, and Thomas R. Anthony, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 7, 1978, Ser. No. 967,280
Int. Cl.[2] H01L *21/225*
U.S. Cl. 148—1.5 **10 Claims**

1. In the method of moving a melt of metal-rich semiconductor material through a solid body of semiconductor material by thermal gradient zone melting processing comprising the steps of

(a) selecting a body of single crystal semiconductor material so that the body has a first type conductivity, a selected resistivity, and at least one major surface having a preferred planar crystal structure orientation which is one selected from the group consisting of (100), (110) and (111), the vertical axis of the body being substantially aligned with a first axis of the crystal structure;

(b) preparing the surface having the preferred planar crystal structure orientation to accommodate one or more physical configurations of a layer of metal thereon;

(c) depositing an array of a first metal on the surface of the body of semiconductor material having the preferred planar crystal structure orientation, the metal of the array having a preferred geometric configuration;

(d) heating the body and the first metal by a source of radiant energy to a temperature sufficient to form a melt of metal-rich material on the surface of the body;

(e) establishing a unidirectional temperature gradient along substantially the vertical axis of the body and the first axis of the crystal structure;

(f) migrating the metal-rich melt through the body along the first axis of the crystal structure to divide the body into a plurality of regions of first type conductivity and to form at least one or more regions of recrystallized material of the body having solid solubility of the vapor deposited metal therein, the first metal including at least one dopant impurity material therein to impart a second type conductivity and a selected level of resistivity thereto, the improvement in the method of

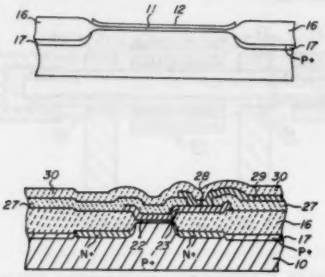
depositing a first layer of a material on at least the major surface having the preferred planar crystal orientation, the layer being of a sufficient thickness to make it opaque to the radiant energy emitted by the body of semiconductor material.

4,170,492

METHOD OF SELECTIVE OXIDATION IN MANUFACTURE OF SEMICONDUCTOR DEVICES

Keith G. Bartlett, Houston; Laurence R. Jordan, Sugarland, and Randall S. Mundt, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 18, 1978, Ser. No. 897,318
Int. Cl.[2] H01L *21/265, 21/26*
U.S. Cl. 148—1.5 6 Claims



5. A method of making an insulated gate field effect transistor comprising the steps of applying a first oxidation mask to a part of a face of a silicon body, oxidizing said face to grow thick field oxide where the face is not covered by the mask, forming a second oxidation mask over only a portion of said part to provide a channel area, subjecting said face to an ion implant of conductivity determining impurity atoms which enhance the rate of oxide growth, the second oxidation mask also masking said implant, growing oxide on said face at a temperature of at least about 800 Degrees C. and not more than about 200 Degrees C. to produce an oxide coating over impurity doped source and drain regions in said surface, the implanted impurity causing oxide growth in said selected areas at an enhanced rate compared to that beneath the oxidation mask, thereby minimizing lateral encroachment of oxide growth beneath the edges of the oxidation mask.

4,170,493

METHOD FOR TREATMENT OF OXIDIZED METAL SURFACES

Ian B. Schafer, 24 Trevorten St., Glenunga, Australia (5064)

Filed Oct. 26, 1977, Ser. No. 845,473
Claims priority, application Australia, Oct. 28, 1976, PC7910
Int. Cl.[2] C23F *7/00, 7/04, 7/10*
U.S. Cl. 148—6.14 R 10 Claims

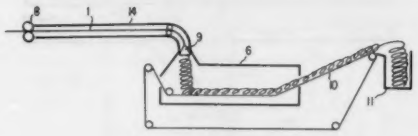
1. A method of treating a metal surface which has portions oxidized which includes applying to the surface a liquid containing in aqueous solution at least two substances, one of which is an acid of a type to effect reduction of the oxidized portions of the metal and being an acid from the group consisting of phosphoric, acetic and hydrochloric acids, and the second substance is an amide and of such concentration to effect a substantial slowing down of the reduction action whereby to allow substantial penetration of the porous oxide by the liquid with the acid this being of substantial strength, prior to substantial reduction occurring.

4,170,494

SURFACE TREATMENT FOR METAL ACCORDING TO FLUIDIZED BED SYSTEM

Sumihide Fujii, Kobe; Hazime Fukinbara, Kakogawa; Katuzi Mizutani, Takasago; Minoru Nishibe, and Yoshitomo Ishii, both of Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Jun. 7, 1977, Ser. No. 804,259
Claims priority, application Japan, Jun. 7, 1976, 51/66912
Int. Cl.[2] B05D *1/24*
U.S. Cl. 148—12 B 18 Claims



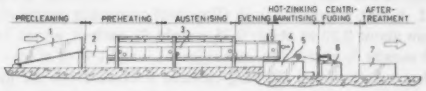
1. A method of coating hot-rolled steel wire, rod or bar with concomitant patenting or other controlled cooling, which comprises the step of introducing steel wire, rod or bar after hot rolling into a fluidized bed having a non-oxidizing gas as a fluidizing medium and containing fluidized metal or alloy particles having a low melting point to contact said steel wire, rod or bar with said fluidizied metal or alloy particles so that said fluidized metal or alloy particles melt and solidify on the surface of said steel wire, rod or bar, thereby forming a coating of said metal or alloy having a low melting point on the surface of said steel wire, rod or bar, and concomitantly effecting a phase transformation of said steel wire, rod or bar in said fluidized bed; wherein the temperature of said steel wire, rod or bar when introduced into said fluidized bed is not less than the melting point of said metal or alloy having a low melting point.

4,170,495

METHOD AND MEANS FOR HARDENING AND HOT-ZINCING IRON AND STEEL PRODUCTS

Raimo Talikka, 27110 Irjanne, Finland

Filed Jun. 30, 1976, Ser. No. 701,753
Claims priority, application Finland, Jul. 3, 1975, 751952
Int. Cl.[2] C21D *1/48*
U.S. Cl. 148—15 9 Claims



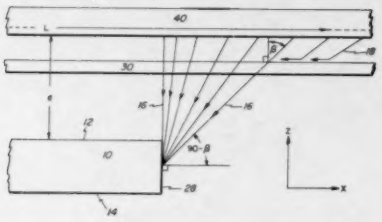
1. A method for simultaneous hardening and hot-zincing of low-carbon steel products consisting of the consecutive continuous steps of heating the products in a furnace to the austenitizing temperature of 850°–1000° C. in an atmosphere of a reducing gas to prevent decarburizing, evening and controlling the temperature of the austenitized products to a temperature not below the A_{c3} temperature in the end zone of said furnace in an atmosphere of a carbon-free protective gas to protect against contact with oxygen, introducing said products directly into a zinc bath at a temperature above the M_s temperature for simultaneous hot-zincing and hardening for a period of time sufficient to produce bainite hardening, removing the hardened zinced products from the zinc bath, removing excess zinc from the products and cooling the products.

4,170,496

BEVELED WAFER FOR THERMAL GRADIENT ZONE MELTING UTILIZING A BEVELED WAFER EDGE

Thomas R. Anthony, Schenectady, N.Y., and Harvey E. Cline, Stanford, Calif., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 7, 1978, Ser. No. 967,284
Int. Cl.[2] H01L *21/225*
U.S. Cl. 148—33 3 Claims



1. A body of semiconductor material suitable for processing by thermal gradient zone melting comprising:

a body of semiconductor material having a first type conductivity, a selected level of resistivity, an outer side peripheral surface, two major opposed substantially parallel surfaces which are, respectively, the top and bottom surfaces thereof, and at least one major surface has a preferred planar crystal structure orientation which is one selected from the group consisting of (100), (110) and (111), and a vertical axis of the body being substantially aligned at a predetermined angle with a first axis of the crystal structure; and

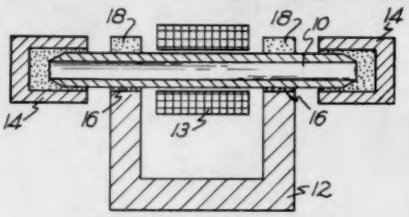
the outer side peripheral surface is beveled to form an included angle α with the bottom surface equal to approximately 41°.

4,170,498

TRANSDUCER

Ernest M. Jost, Plainville; Arthur L. Reenstra, Attleboro, both of Mass., and George Trenkler, East Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 637,482, Dec. 3, 1975, Pat. No. 4,068,527, which is a division of Ser. No. 427,943, Dec. 26, 1973, Pat. No. 3,940,992. This application Jan. 17, 1978, Ser. No. 870,169
Int. Cl.[2] H04R *15/00;* H01L *41/20, 41/22*
U.S. Cl. 148—121 11 Claims



1. A method of making a magnetostrictive sensing element comprising the steps of taking a sheet of magnetic material, annealing the sheet to render it malleable, cutting the sheet in a traepzoidal configuration, rolling the sheet upon itself to form a scroll from one parallel end to another parallel end so that upon rolling the scroll will have conical ends and heat treating the sheet to optimize its magnetic properties.

4,170,497

HIGH STRENGTH, TOUGH ALLOY STEEL

Gareth Thomas, Berkeley, and Bangaru V. N. Rao, Albany, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 24, 1977, Ser. No. 827,252
Int. Cl.[2] C22C *38/18*
U.S. Cl. 148—36 8 Claims

1. A high strength, tough alloy steel consisting essentially of from about 0.20 to about 0.35 weight % carbon, about 3.0 to 4.5 weight % chromium, and at least 1 weight % of at least one other substitutional alloying element selected from the group consisting of nickel, manganese, molybdenum, cobalt, silicon, aluminum, and mixtures thereof, and the remainder iron, said steel being characterized by a microstructure of uniformly dispersed martensite crystals, the major portion of which are in dislocated form, said martensite crystals being formed by martensite transformation from austenite, said steel including a maximum alloy content below that which lowers the martensite transformation temperature to below about 250° C., said steel being characterized by a yield strength of at least about 180,000 psi, a room temperature Charpy impact energy of at least about 19 ft-lbs. and a plane strain fracture toughness (K_{IC}) of at least about 80 KSI-in$^{\frac{1}{2}}$, said martensite crystals being separated from each other by substantially continuous thin boundary films of stabilized retained austenite essentially free of carbides, and including autotempered carbides dispersed in said martensite.

4,170,499

METHOD OF MAKING HIGH STRENGTH, TOUGH ALLOY STEEL

Gareth Thomas, Berkeley, and Bangaru V. N. Rao, Albany, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

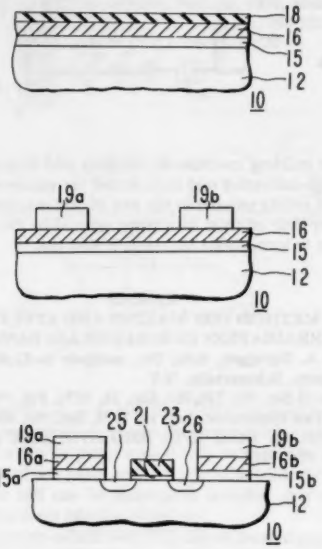
Continuation-in-part of Ser. No. 827,252, Aug. 24, 1977. This application Sep. 14, 1978, Ser. No. 942,267
Int. Cl.[2] C21D *1/22*
U.S. Cl. 148—143 9 Claims

1. The method of forming a high strength, tough alloy carbon steel comprising heating an alloy steel to a temperature above the austenite transformation temperature to form a homogeneous austenite phase with the alloying elements in solution, and cooling the steel to transform the major portion of austenite to martensite at a temperature of at least about 250° C. to form a microstructure of uniformly dispersed martensite crystals, the major portion of which are in dislocated form, and continuous thin boundary films of stabilized austenite essentially free of carbides separating said martensite crystals, said steel being characterized by a yield strength of at least about 180,000 psi, a room temperature Charpy impact energy of at least about 19 ft/lbs. and a plane strain fracture toughness (K_{IC}) of at leasi about 80 KSi-in$^{\frac{1}{2}}$, said steel consisting essentially of from about 0.20 to about 0.35 weight % carbon, about 3.0 to 4.5 weight % chromium, and at least 1 weight % of at least one other substitutional alloying element selected from the group consisting of nickel, manganese, molybdenum, cobalt, silicon, aluminum, and mixtures thereof, said steel including a maximum alloy content below that which lowers the martensite transformation temperature to below 250° C.

4,170,500
PROCESS FOR FORMING FIELD DIELECTRIC REGIONS IN SEMICONDUCTOR STRUCTURES WITHOUT ENCROACHING ON DEVICE REGIONS

Peter A. Crossley, Garden Grove, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jan. 15, 1979, Ser. No. 3,674
Int. Cl.[2] H01L *21/265, 21/225, 21/22*
U.S. Cl. 148—187 10 Claims



1. A process for forming field dielectric regions on a semiconductor substrate comprising:

forming an insulating layer on the semiconductor substrate,

forming regions of selected material on said insulating layer wherever the field dielectric regions are desired,

converting the selected material to insulating material, and

removing the insulating layer from the substrate except where the regions of insulating material overly the insulating layer.

4,170,501
METHOD OF MAKING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE UTILIZING SIMULTANEOUS OUTDIFFUSION AND AUTODOPING DURING EPITAXIAL DEPOSITION

Heshmat Khajezadeh, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

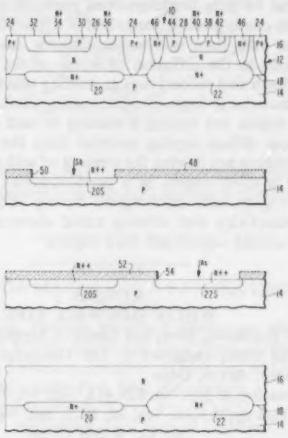
Filed Feb. 15, 1978, Ser. No. 877,856
Int. Cl.[2] H01L *21/20, 21/74*
U.S. Cl. 148—175 4 Claims

1. A method of making a semiconductor device comprising

forming adjacent to a first portion of a surface of a substrate of semiconductive material of one type conductivity a first localized region containing opposite type conductivity modifiers consisting essentially of a first chemical element having a predetermined diffusion coefficient in said semiconductor material and a predetermined vapor pressure at a given temperature,

forming adjacent to a second portion of said substrate surface a second localized region containing opposite type conductivity modifiers consisting essentially of a second different chemical element having a diffusion coefficient substantially the same as said first chemical element but a substantially higher vapor pressure at said given temperature,

growing an epitaxial layer of said semiconductor material on said surface of said substrate at said given temperature whereby that portion of said epitaxial layer which is adjacent to said second region contains an autodoped number of atoms of said second chemical element which is greater than the autodoped number of atoms of said first chemical element in that portion of said epitaxial layer which is

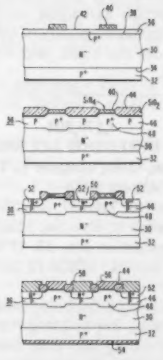


adjacent to said first localized region, introducing conductivity modifiers into that portion of said epitaxial layer which is adjacent to said first localized region to define a circuit element having predetermined characteristics, and introducing conductivity modifiers into that portion of said epitaxial layer which is adjacent to the second localized region to define a circuit element having characteristics different from those of the first mentioned circuit element.

4,170,502
METHOD OF MANUFACTURING A GATE TURN-OFF THYRISTOR

Yaichiro Watakabe, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1978, Ser. No. 922,890
Claims priority, application Japan, Aug. 18, 1977, 52-99367
Int. Cl.[2] H01L *21/225*
U.S. Cl. 148—191 6 Claims



1. A method of manufacturing a gate turn-off thyristor com-

prising forming a first region of a first-type of conductivity on a first major surface of a body of semiconductor material having a second type of conductivity by introducing doping means through said first surface, forming a second region of said first type of conductivity on a second major surface of said body of semiconductor material by introducing doping material through said second surface, said second region being doped to a higher level than said first region, said first and second major surfaces of said body of semiconductor material being substantially parallel to each other, forming a coating of a material on only predetermined portions of said second region, said coating being comprised of a material having a lower oxidation rate than said semiconductor material and being impervious to the diffusion of atoms of the doping material used to form said second region, heating said body of semiconductor material to form an oxide coating on that portion of said second region not having a coating of said material thereon and to out diffuse doping material from the portions of said second region not having the coating of said material thereon, forming a third region in a predetermined portion of said second region, said third region having said second type of semiconductivity and affixing metal electrodes to said first region, second region and third region.

4,170,503

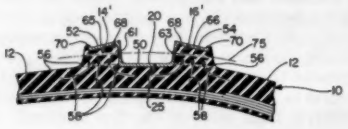
WHITE SIDEWALL TIRE

Jack W. Buchanan, Stow, and Daniel J. Lindner, North Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 625,412, Oct. 20, 1975, abandoned. This application Sep. 26, 1977, Ser. No. 836,454

Int. Cl.[2] B29H *17/00*

U.S. Cl. 156—116 **3 Claims**



1. The method of making a tire having a white sidewall comprising disposing a thin strip of white rubber compound circumferentially about the external surface of the sidewall region of the tire in its uncured state, placing the uncured tire in a tire curing mold with the thin strip exposed to direct contact with the mold, in the mold displacing relatively of each other an intermediate portion of the width of the thin strip inwardly and respective margins of the width of the thin strip outwardly in directions normal to the sidewall region to form in said strip between said intermediate portion and each of said margins a wall of substantially diminished thickness relative to said intermediate portion extending normal to the sidewall region contour and circumferentially of said region, curing and removing the tire from the mold, and removing an outward portion of each wall.

4,170,504

TIRE BUILDING ACCESSORY

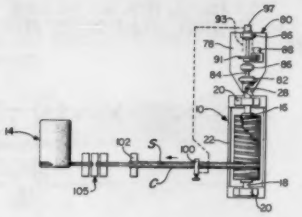
Robert S. Riggs, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 718,657, Aug. 30, 1976, abandoned, which is a continuation of Ser. No. 516,249, Oct. 21, 1974, abandoned. This application Jan. 23, 1978, Ser. No. 871,674

Int. Cl.[2] B29H *17/20*

U.S. Cl. 156—123 R **5 Claims**

2. A method of building a tire comprising winding a running length of a strip of tacky tire building material about a supply reel, and while maintaining said strip free of twist traversing said reel axially to and fro to form a successive plurality of helical layers of alternating lead extending axially substantially from end to end of said reel, combining in face-to-face contact with said strip a separator cloth while winding said strip so as to wind said strip and said cloth convolutely together on said supply reel, and then delivering said strip from said supply reel



to a tire building machine for winding said strip therearound and while delivering said strip to said tire machine, traversing said reel axially parallel to the axis of said machine to deliver said strip free of twist in a plane normal to the axis of said machine to incorporate said strip in said tire.

4,170,505

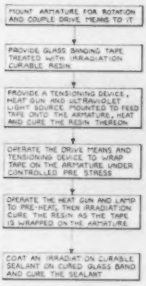
METHOD FOR MAKING AND APPLYING IRRADIATION CURABLE GLASS BANDING

Martin A. Zgraggen, Erie, Pa., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 726,357, Sep. 24, 1976, Pat. No. 4,128,777. This application Aug. 14, 1978, Ser. No. 933,291

Int. Cl.[2] B65H *81/00;* **B32B** *31/08;* **B29C** *19/02*

U.S. Cl. 156—162 **11 Claims**


MOUNT ARMATURE FOR ROTATION AND COUPLE DRIVE MEANS TO IT
PROVIDE GLASS BANDING TAPE TREATED WITH IRRADIATION CURABLE RESIN
PROVIDE A TENSIONING DEVICE, HEAT GUN AND ULTRAVIOLET LIGHT SOURCE POINTED TO FEED TAPE ONTO THE ARMATURE, HEAT AND CURE THE RESIN THEREON
OPERATE THE DRIVE MEANS AND TENSIONING DEVICE TO WRAP TAPE ON THE ARMATURE UNDER CONTROLLED PRE STRESS
OPERATE THE HEAT GUN AND LAMP TO PRE-HEAT, THEN IRRADIATION CURE THE RESIN AS THE TAPE IS WRAPPED ON THE ARMATURE
COAT AN IRRADIATION CURABLE SEALANT ON CURED GLASS BAND AND CURE THE SEALANT

1. A method for applying a glass banding tape to a dynamoelectric machine armature comprising the steps of:

(a) mounting the armature for rotation about its longitudinal axis,

(b) coupling drive means to the armature for rotating it at a controlled rate,

(c) providing a length of glass core banding tape treated with irradiation curable resin,

(d) providing a tensioning device for feeding the tape to the armature under controlled tension,

(e) providing a heat gun mounted adjacent the armature for heating the resin on the glass core banding tape before it is placed on the armature,

(f) providing a lamp mounted next to the armature for producing irradiation to cure the resin on the tape as the band is wrapped on the armature by rotation thereof,

(g) operating the drive means and the tensioning devices to wrap a plurality of pre-stressed layers of glass banding tape on the armature to form a multi-layer band, and

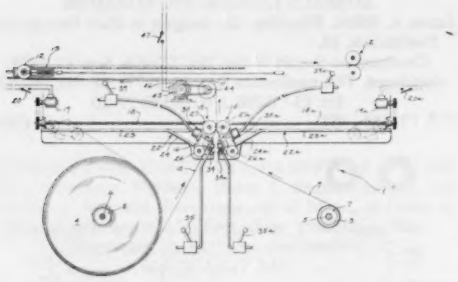
(h) operating the heat gun and lamp to, respectively, promote flow of the resin as the tape is wrapped on the armature and to adhesively bond and cure the resin as it is

passed through an irradiation curing zone produced by the lamp.

4,170,506
METHOD OF WEB SPLICING

Carl R. Marschke, Phillips, Wis., assignor to Marquip, Inc., Phillips, Wis.

Continuation of Ser. No. 669,309, Mar. 22, 1976, abandoned. This application May 4, 1977, Ser. No. 793,552
Int. Cl.[2] B65H *19/16, 19/18, 19/20*
U.S. Cl. 156—159 **4 Claims**



1. A method for use in connection with a machine for utilizing a traveling continuous web of paper or the like, and wherein a plurality of paper supply rolls are provided so that when the web of one paper roll is nearly exhausted, the web of a fresh paper roll can be substituted therefor, said method comprising the steps of:

(a) feeding a first-named web from one of the said paper rolls past a splicing device and hence past a dancer roll and to the input of the machine,

(b) passing the said first-named web over a fixed idler roll between said splicing device and said dancer roll,

(c) applying a braking force to said first-named web downstream of said one of said paper rolls and upstream of said splicing device,

(d) splicing a second-named web to the said first-named web at said splicing device,

(e) severing the second-named web from the first-named web,

(f) releasing said braking force,

(g) and then driving said idler roll as a capstan to tension and accelerate the spliced web back to line speed.

4,170,507
METHOD FOR ENCAPSULATING A SOLAR CELL ARRAY

Michael C. Keeling, Tempe, and Dwight E. Doss, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1977, Ser. No. 865,038
Int. Cl.[2] F24J *3/02*
U.S. Cl. 156—245 **5 Claims**

1. A process for encapsulating a solar cell module comprising:

placing an array of interconnected solar cells between a back plate adapted to receive said array and a cover glass;

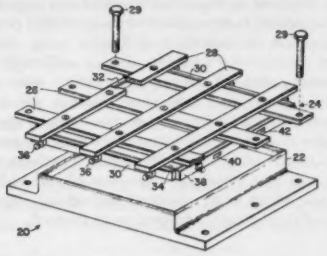
positioning said back plate and said cover glass a predetermined distance apart;

providing a temporary edge seal between said back plate and said cover glass;

filling the enclosure thus formed with a potting material;

curing said potting material;

removing said temporary edge seal;



contacting said back plate and said cover glass; and

affixing a permanent seal securing said back plate and said cover glass.

4,170,508
PROCESS FOR MAKING SELF-EXTINGUISHING LAMINATES

Joachim Wortmann, Türnich; Burkhard Schönrogge, Hamburg; Joseph Cremer, Hürth, and Franz-Josef Dany, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Hurth-Knapsack, Fed. Rep. of Germany

Filed Jun. 27, 1978, Ser. No. 919,472
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729527
Int. Cl.[2] C09J *5/02*
U.S. Cl. 156—308 **7 Claims**

1. In a process for making a self-extinguishing synthetic resin laminate, wherein individual layers of a carrier material are impregnated with a thermosetting phenolic resin containing a flame-retardant agent and the impregnated layers are placed one above another and bonded together by compressing them at elevated temperature and under elevated pressure to give a hardened laminate, the improvement which comprises: dispersing finely pulverulent phosphorus pentanitride as a flame-retarding agent in the plasticized or non-plasticized thermosetting phenolic resin; the phenolic resin, based on its solid matter content, and the phosphorus pentanitride being used in an approximate ratio by weight of 100:4 to 100:15; and the phenolic resin, based on its solid matter content, and the carrier being used in an approximate ratio by weight of 100:80 to 100:150.

4,170,509
TIRE BUILDING APPARATUS

Donald C. Kubinski, Wadsworth, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 10, 1978, Ser. No. 894,796
Int. Cl.[2] B29H *17/20*
U.S. Cl. 156—405 R **9 Claims**

1. An apparatus for applying a sheet of tire making material to a tire building drum having a rotation axis comprising, a frame,

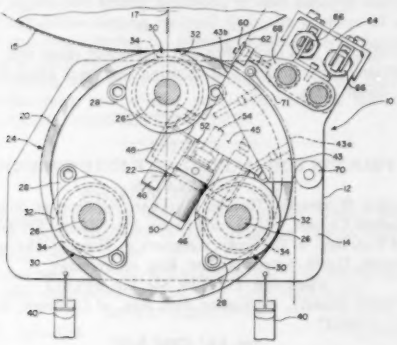
means for transferring said sheet to said drum in response to rotation thereof including a multiplicity of identical rings arranged in parallel spaced apart planes about a common axis parallel to the axis of said drum to define a hollow cylinder on which said sheet material can be arcuately wrapped;

three shafts extending parallel to and equally spaced radially of said common axis and spaced angularly thereabout, said shafts being rotatably mounted in said frame;

a plurality of flanged rolls corotatably mounted respectively on said shafts, each roll having a multiplicity of pairs of annular flanges each pair thereof defining an annular groove therebetween having a cross-section commensu-

rate with the cross-sections of said rings, said rolls being disposed on said shafts such that each said groove be in coplanar alignment with the respectively associated grooves of the rolls on the other two shafts, said rings being disposed in respectively coplanarly aligned grooves and supported therein concentrically of said common axis for rotation thereabout, said flanges being disposed between respectively adjacent pairs of said rings;

knife means, and lift means cooperating with said knife means for severing said sheet from a running length thereof including a plurality of shoes having spaced parallel sides spaced commensurately of said flanges and having identical arcuate radially outward surfaces the curvatures of which equal the curvature of said hollow cylinder, said shoes being disposed individually between said rings of respectively adjacent pairs thereof;



a support member extending parallel to said axis inside of and through said cylinder and to which said shoes are affixed, slide means fixed in said frame and carrying said support member for movement outwardly of said common axis between a first position wherein said radially outward arcuate surfaces of said shoes are disposed flush with to inward of the radially outward surfaces of said rings and a second position wherein said arcuate surfaces of said shoes are disposed radially outward of the radially outward surfaces of said rings to raise said sheet outwardly of said hollow cylinder;

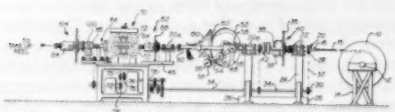
and means for moving said frame away from and toward said building drum to position said rings in sheet transfer relation to apply said sheet to said drum.

4,170,510

APPARATUS AND METHOD FOR ASSEMBLING COMMUNICATIONS CABLE CONTAINING FIBER OPTIC CONDUCTORS

William J. Brorein, Whippany, N.J., and Robert Tattanelli, Brooklyn, N.Y., assignors to General Cable Corporation, Greenwich, Conn.

Filed Jan. 30, 1978, Ser. No. 871,471
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—432 **21 Claims**



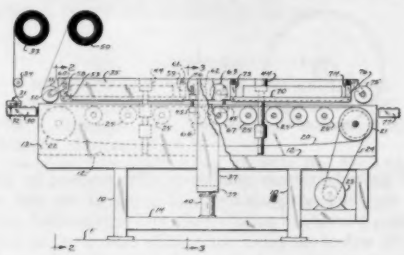
1. Apparatus for making fiber optic cables including a guide through which a strength member of circular cross-section is longitudinally advanced, the strength member having a plastic coating secured to the outside surface thereof, the plastic coating being exposed at a location adjacent to the guide, a groove cutting station, a cutter at the groove cutting station in position to cut a helical groove in the coating on the strength member, a conductor feed station beyond the groove cutting station in the direction in which the strength member has longitudinal movement, means at the conductor feed station for feeding fiber optic conductors and conductor protection material into the helical groove, a wrapping station beyond the feed station with means for applying binding material around the circumference of the plastic coating to retain the conductors and their protection material in the helical groove, and means for advancing the strength member, and the structure carried thereby, through the apparatus at a controlled speed.

4,170,511

SURFACE LAMINATING MACHINE

James A. Milne, Wheeling, Ill., assignor to Pace Incorporated, Northbrook, Ill.

Continuation-in-part of Ser. No. 723,026, Sep. 13, 1976, abandoned. This application Dec. 21, 1977, Ser. No. 862,975
Int. Cl.[2] B30B *3/00*; B32B *31/20*
U.S. Cl. 156—498 **9 Claims**



1. A machine for surface laminating materials with high viscosity, hot melt adhesive, consisting essentially of:

a frame,

conveying means on the frame for carrying and moving a sandwich of core, adhesive and laminate in a path through the machine with the laminate uppermost and exposed to ambient atmosphere,

heating means above the conveying means having means for applying heat to the adhesive for progressively raising the temperature of the sandwich adhesive from ambient to tackiness to activating temperature across the width of the sandwich and in progression lengthwise of the sandwich,

first support means secured to said machine supporting said heating means above the sandwich including means providing low unit pressure application to the sandwich in an amount up to the weight of said first support means and said heating means,

said means for providing low unit pressure to the heating means comprising pivoted links secured to said machine and to one end of said first support means and at least one roller on said first support means in contact with said sandwich to provide said low unit pressure to the sandwich,

pressure applying means above and below the sandwich path and immediately adjacent the heating means for physically migrating the activated adhesive into intimate contact with the core and the laminate,

cooling means above the conveying means immediately following the pressure applying means and having heat extraction means for progressively extracting heat from the adhesive reducing the adhesive's temperature from activating temperature to a lower mechanical bonding temperature,

second support means on said machine supporting said cooling means above the sandwich including means providing low unit pressure application to the sandwich in an

amount up to the weight of said second support means and said cooling means,

said means for providing low unit pressure to the cooling means comprising pivoted links secured to said machine and to one end of said second support means and at least one roller on said second support means in contact with said sandwich to provide said low unit pressure to the sandwich,

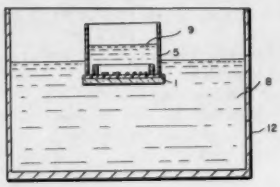
said respective heating, pressure applying and cooling means being spaced closely together in tandem preventing substantial change in temperature of the adhesive while said sandwich is moving between said means so as to mechanically bond said core and laminate in the position occupied exiting the pressure applying means.

4,170,512

METHOD OF MANUFACTURE OF A SOFT-X-RAY MASK

Dale C. Flanders, Waltham; Henry I. Smith, Sudbury, and Muriel A. Dalomba, Dorchester, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 26, 1977, Ser. No. 800,759
Int. Cl.[2] G21F *5/04*
U.S. Cl. 156—631 **17 Claims**



1. A method of making a soft-x-ray mask of a composite sheet of x-ray transmissive plastic and another x-ray opaque patterned material comprising:

applying said plastic in liquid form to a substrate,

hardening said plastic to form an optically smooth polymer film of plastic whose thickness and composition is substantially transparent to soft-x-rays and which has a mechanical bond to said substrate,

depositing photolithographically patternable soft x-ray opaque material on said hardened plastic to form a mechanical bond therewith and hence a composite material of said plastic and opaque material,

patterning a region of said deposited material to form a mask of said x-ray opaque material on said plastic,

adhesively attaching a mechanical support to said composite material to enclose said patterned region within said support,

dissolving the entire said substrate to leave only the composite material as attached to said support,

removing that portion of said composite material external to said mechanical support to provide a supported mask.

8. The method of claim **1** comprising in addition:

adhesively attaching a mask holder to the plastic nonpatterned side of said composite material to contain said pattern within said mask holder, said attachment being made after said substrate is etched away, and thereafter

removing said attached mechanical support after said substrate is totally etched away to leave said composite material within and attached only to and supported by mask holder.

4,170,513

RECOVERY OF TUNGSTEN CARBIDE FROM SCRAP MINING BITS

Fernand J. Piche, Rutherglen, Canada, assignor to Fernand Piche Enterprises Limited, Rutherglen, Canada

Filed Jun. 6, 1978, Ser. No. 913,049
Int. Cl.[2] C23F *1/02*
U.S. Cl. 156—656 **14 Claims**

1. A method for the recovery of tungsten carbide inserts from worn steel drilling bits, which comprises:

subjecting said bits to acid treatment in an acid treatment bath for a time at least sufficient to eat away any turned over burrs from around said inserts,

heating said acid treated bits to an elevated temperature at least sufficient to loosen said inserts within their sockets in said bits so that they may be removed by strong vibration, and

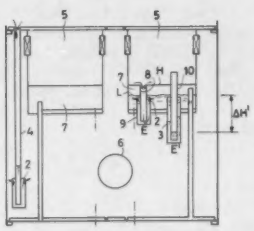
subjecting the heated bits to strong vibration to dislodge said inserts from their sockets.

4,170,514

APPARATUS FOR THE DESALINATION OF SEA WATER, WITH AUTOMATIC REGULATION OF THE FRESH AND SALT WATER LEVELS

Giorgio Pagani, Milan, Italy, assignor to Snamprogetti, S.p.A., Milan, Italy

Continuation of Ser. No. 705,011, Jul. 14, 1976, abandoned. This application Feb. 16, 1978, Ser. No. 878,468
Claims priority, application Italy, Jul. 15, 1975, 25420 A/75
Int. Cl.[2] B01D *1/26*
U.S. Cl. 159—18 **3 Claims**



1. In an apparatus for desalinating sea water characterized in that it is composed by a vertically positioned column subdivided into a plurality of cylindrical sections, each of which comprises the following components:

(a) a film-evaporator in a tube bundle vertical arrangement having a circular cross-sectional outline;

(b) a basin which is connected at the bottom portion with a top tube plate of an evaporator in the same cylindrical section, the basin in the last section being deprived of the evaporator and being connected to the brine discharge tube, and said basin connected at its top with a bottom tube plate of the evaporator of the overlying section, said basin being connected, in the first cylindrical section to the sea water feeding tube;

(c) a lamination system arranged at the bottom of the basin that is adapted to allow brine to flow from the basin to the film evaporator;

(d) openings formed through the upper sidewall of the basin except that of the cylindrical section;

(e) one or more siphoning tubes for taking the condensate collected at the bottom of each cylindrical section to recycle the condensate at intermediate points of the subsequent cylindrical section; the improvement which comprises a lamination system that comprises in combination: a fall tube attached to a horizontal plate in the bottom of the basin; said fall tube being inserted in the upper end portion of a larger closed end riser tube that is coaxial

with said fall tube; said riser tube having a plurality of slots in its upper portion.

4,170,515
PROCESS FOR BLEACHING PEAT MOSS AND RESULTING PRODUCT

Jean-Marc Lalancette, and Bernard Coupal, both of Sherbrooke, Canada, assignors to Johnson & Johnson, New Brunswick, N.J.

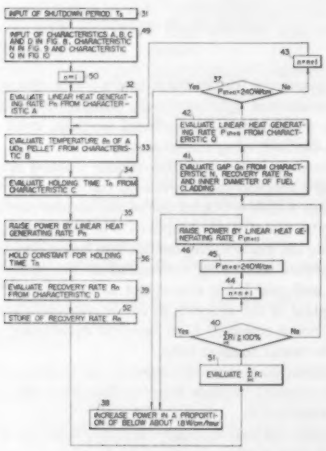
Filed Feb. 21, 1978, Ser. No. 879,833
Int. Cl.[2] D01B *1/50*
U.S. Cl. 162—92 **70 Claims**

1. A process for bleaching peat moss comprising; (a) forming a slurry of peat moss of a pumpable consistency, (b) treating said slurry with active chlorine in combination with a material selected from the group consisting of alkali carbonates, alkali hydroxides, alkaline earth carbonates and alkaline earth hydroxides while maintaining the pH of said slurry at 7 or less, (c) dewatering said slurry to a solids content of at least 5%, and (d) washing said dewatered slurry with acid to produce a bleached peat moss.

4,170,516
METHOD OF OPERATING A NUCLEAR REACTOR

Katsutoshi Shinbo, Katsuta, and Takanori Hosokawa, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 7, 1976, Ser. No. 674,690
Claims priority, application Japan, Apr. 7, 1975, 50-41302
Int. Cl.[2] G21C *7/00*
U.S. Cl. 176—20 R **34 Claims**


INPUT OF SHUTDOWN PERIOD T_S
INPUT OF CHARACTERISTICS A, B, C AND D IN FIG. 8, CHARACTERISTIC N IN FIG. 9 AND CHARACTERISTIC O IN FIG. 10
n=1
EVALUATE LINEAR HEAT GENERATING RATE P_0 FROM CHARACTERISTIC A
EVALUATE TEMPERATURE θ_m OF A UO_2 PELLET FROM CHARACTERISTIC B
EVALUATE HOLDING TIME T_h FROM CHARACTERISTIC C
RAISE POWER BY LINEAR HEAT GENERATING RATE P_n
HOLD CONSTANT FOR HOLDING TIME T_h
EVALUATE RECOVERY RATE R_n FROM CHARACTERISTIC D
STORE OF RECOVERY RATE R_n
INCREASE POWER IN A PROPORTION OF BELOW ABOUT 1.8 W/cm/hour
n=n+1
Yes
P_{n+1}=240W/cm
No
EVALUATE LINEAR HEAT GENERATING RATE P_{n+1} FROM CHARACTERISTIC O
EVALUATE GAP G_n FROM CHARACTERISTIC N, RECOVERY RATE R_n AND INNER DIAMETER OF FUEL CLADDING
RAISE POWER BY LINEAR HEAT GENERATING RATE P_{n+1}
P_{n+1}=240W/cm
n=n+1
$\sum R_i \geq 100\%$
EVALUATE $\sum R_i$

1. A method of operating a nuclear reactor during the period when power of the nuclear reactor is raised, comprising the steps of raising the power from zero W/cm after reactor shutdown up to 240 W/cm of a linear heat generating rate of nuclear fuel elements containing UO_2 fuel pellets surrounded by a zirconium alloy and located in a core of the nuclear reactor utilizing a first control means providing coarse power regulation, raising the power of the nuclear reactor in a range over the linear heat generating rate 240 W/cm utilizing a second control means providing fine power regulation, and stopping the power rise to the nuclear reactor and holding the power at a fixed level at least once in a range below a linear heat generating rate corresponding to a length of a shutdown period of time of said nuclear reactor before the linear heat generating rate reaches 240 W/cm, and wherein the power of said reactor is held constant at least once somewhere in the range zero to P which satisfies the relation

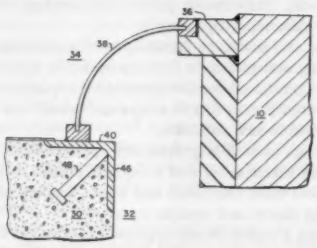
$$P \leqq P_0\left(1 - \frac{l_n T_S}{l_n T_{S0}}\right),$$

where P is a linear heat generating rate at which said nuclear fuel elements initiate the Pellet Clad Mechanical Interaction; T_S is the shutdown period of the reactor; P_0 is a linear heat generating rate which causes said nuclear fuel elements to induce Pellet Clad Mechanical Interaction for the first time, after said reactor is restarted when the reactor shutdown period T_S is zero; and T_{S0} is the reactor shutdown period when $P=0$.

4,170,517
PERMANENT SEAL RING FOR A NUCLEAR REACTOR CAVITY

Robert E. Meuschke, Pittsburgh, Pa.; Walter E. Desmarchais, Corona del Mar, Calif., and Leonard R. Katz, Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 3, 1974, Ser. No. 502,315
Int. Cl.[2] G21C *19/20*
U.S. Cl. 176—87 **6 Claims**



1. A nuclear reactor containment arrangement including:
an open ended pressure vessel operable to expand and contract during cyclic operation of the reactor;
a structural wall spaced from and surrounding the peripheral wall of the pressure vessel defining an open annulus therebetween; and
a water tight flexible annular ring seal having a quarter-circular cross section permanently affixed to and extending between the peripheral wall of the vessel proximate the vessel opening and the structural wall, the seal being constructed to cyclicly contract and expand respectively with cyclic expansion and contraction of the vessel relative to the wall during reactor operation while maintaining the water-tight integrity of the seal.

4,170,518

MICROBIOLOGICAL CONVERSION OF STEROL DERIVATIVES TO 5-ANDROSTEN-17-ONE DERIVATIVES AND THEIR USE

Alfred Weber; Mario Kennecke; Alfred Popper; Rudolf Müller; Ulrich Eder; Gregor Haffer; Gerhard Sauer; Günter Neef, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Bergkamen and Berlin, Fed. Rep. of Germany

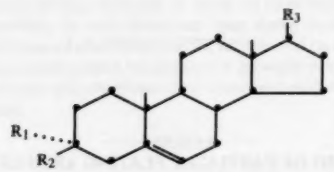
Filed Jul. 30, 1976, Ser. No. 710,559

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1975, 2534911

Int. Cl.[2] C07B *29/02*

U.S. Cl. 435—55 **10 Claims**

1. In a process for the production of 17-keto steroids of the androstane series by subjecting a steroid having a sterol hydrocarbon side chain at the 17-position to the oxidative degradation activity of a culture of microorganism which degrades sterol side chains to 17-keto group, the improvement which comprises conducting the fermentation in the absence of an inhibitor which inhibits attack on the ring system and employing as the starting steroid a sterol derivative of the formula



wherein R_1 is a hydrogen atom and R_2 is alkoxy of 1–4 carbon atoms or R_1 and R_2 collectively are alkylenedioxy of 2–6 carbon atoms and 2–3 carbon atoms bridging the oxygen atom and R_3 is a sterol hydrocarbon side chain of 8–10 carbon atoms.

4,170,519

Patent Not Issued For This Number

4,170,520

APPARATUS FOR MEASURING REACTANT CONCENTRATIONS AND QUANTITIES

James C. Weaver, Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 16, 1977, Ser. No. 833,921

Int. Cl.[2] C12K *1/10*

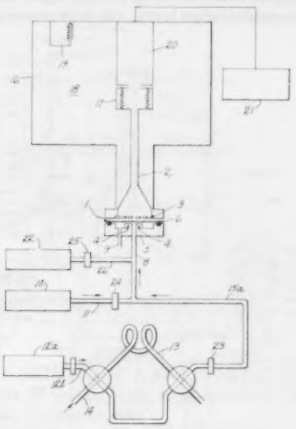
U.S. Cl. 435—288 **7 Claims**

1. Apparatus for measuring the concentration of a substrate in a fluid which substrate reacts to form a vaporous product when contacted with a fixed amount or concentration of an enzyme or microorganism or for measuring the concentration of an enzyme or microorganism in a fluid which enzyme or microorganism catalyzes a reaction to form a vaporous product when contacted with a fixed amount or concentration of a substrate for the enzyme or microorganism wherein either:

(a) the amount or concentration of the substrate is fixed when measuring enzyme or microorganism concentration, or,

(b) the amount or concentration of the enzyme is fixed or the amount or concentration of the microorganism is fixed when measuring the substrate concentration,

which comprises means for mixing said substrate and said enzyme or microorganism, means for directing the resulting mixture to a small channel having a height less than about 10^{-1} cm. and a length less than about 10 cm., said small channel being positioned adjacent a membrane that is permeable to said vaporous product and means for measuring directly the



amount of said vaporous product passing through said membrane.

4,170,521

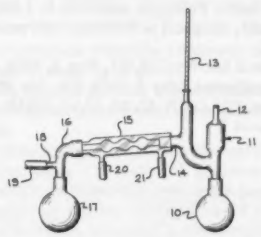
PURIFICATION OF TRIAZOLES

Richard P. Carr, Cincinnati, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed May 22, 1978, Ser. No. 907,943

Int. Cl.[2] B01D *3/34*; C07D *249/04*

U.S. Cl. 203—6 **4 Claims**



1. In a method for purifying a crude benzotriazole, tolytriazole or a mixture of the two, which method includes the steps of vacuum distilling the crude triazole, whereby a triazole vaporizes as distillate, condensing the distillate, and collecting the resultant condensate, and wherein the crude triazole contains color bodies, diazotizable impurities which are color body precursors or both, the improvement comprising subjecting such crude triazole to vacuum distillation in the presence of an amount of formaldehyde sufficient to react with an appreciable proportion of the color bodies, the color body precursors, or both.

4,170,522

FLUID REFINING METHOD

Alvin E. Buggele, #7 Milan Manor Dr., Milan, Ohio 44846

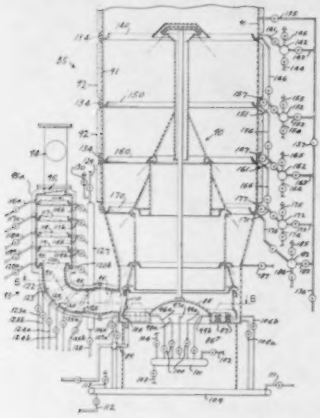
Division of Ser. No. 522,708, Nov. 11, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 620,245

Int. Cl.[2] B01D *3/14*

U.S. Cl. 203—87 **5 Claims**

1. In a method for separating fractions of a liquid which method includes the steps of heating a body of the liquid to a temperature sufficiently high that the liquid has a vapor pressure at least substantially as high as the pressure to which the

body of the liquid is subjected, condensing various fractions of the liquid at various levels above the surface of the heated body of liquid, and collecting various liquid fractions at their respective condensation levels, the improvement of withdrawing liquid at more than one level from at least one liquid fraction collected at its respective condensation level and supplying heat to said various liquid fractions to effect circulation and revaporization of said various liquid fractions.

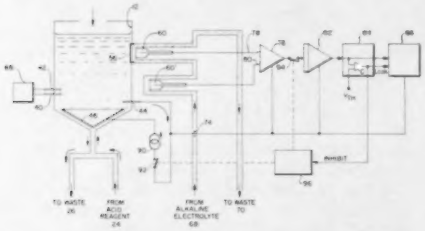


4,170,523

METHOD FOR CHECKING ISOLATION BETWEEN TITRATION AND ELECTROCHEMICAL MEASURING SYSTEMS OF A CHEMICAL ANALYZER

Edmund E. Buzza, Fullerton, and John E. Lillig, Diamond Bar, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 738,791, Nov. 4, 1976, abandoned. This application May 2, 1978, Ser. No. 902,126
Int. Cl.[2] G01N *27/44, 27/46;* G01R *31/00*
U.S. Cl. 204—1 T **4 Claims**



1. The method of operating a combined titration and electrochemical sensing apparatus of the type including an analysis cell having a chamber into which a reagent and a sample material to be analyzed are introduced, coulometric generating means for generating ions combinable with a constituent of said sample material to titrate the same, amperometric detector means for detecting the extent of ion combination with said constituent for providing a measurement of said constituent, and electrochemical sensing means communicating with said chamber and the contents thereof through barrier means which is selectively permeable to a substance in the chamber for detecting said substance to provide a measurement thereof, said method comprising prior to introducing said sample material into said chamber the steps of:

introducing said reagent into said chamber;

enabling said coulometric generating means to titrate a constituent of said reagent toward a predetermined value;

enabling said electrochemical sensing means during the period that said coulometric generating means is enabled for detecting transmission of the signal produced by said coulometric generating means across said barrier means to said electrochemical sensing means;

measuring the signal detected by said electrochemical sensing means in response to said coulometric generating means to determine the isolation provided by said barrier means between said chamber and said electrochemical sensing means for deriving an indication of the integrity of said barrier means;

generating a control signal indicative of a fault in said barrier means if the measure of said detected signal exceeds a predetermined value; and

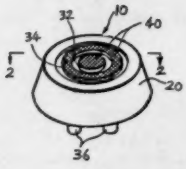
if no fault is indicated in said barrier means, subsequently introducing said sample material into said chamber and said reagent therein and enabling said electrochemical sensing means to detect and measure said substance in said chamber.

4,170,524

METHOD OF PARTIALLY PLATING ARTICLE OR SYNTHETIC RESIN

Noriaki Nakajyo, Tokyo, and Toshihiko Uchiyama, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd. and Kokoku Rubber Industry Company, Ltd., both of, Japan

Filed Jun. 24, 1977, Ser. No. 809,713
Claims priority, application Japan, Jun. 25, 1976, 51-74399
Int. Cl.[2] C25D *5/02, 5/56*
U.S. Cl. 204—15 **4 Claims**



1. A method of partially plating an article of synthetic resin such that the plated portion of the article has at least one region which is completely surrounded by a non-plated region in a plan view of the article, the method comprising the steps of:

(a) producing an article to be plated by uniting at least one first member of a conducting synthetic resin with at least one second member of a non-conducting synthetic resin such that a first portion of the outer surface of said first member in said article is exposed to give entire regions of said article to be plated, including at least one region which is completely surrounded by said non-conducting synthetic resin, and that a second portion of the outer surface of said first member is exposed in a region of said article not to be plated and located remote from said at least one region;

(b) forming a metal coating selectively exclusively on said first portion by a chemical plating procedure; and

(c) selectively electroplating only in the areas of metal coating, by utilizing said second portion as an input electrical terminal for the electroplating.

4,170,525

PROCESS FOR PLATING A COMPOSITE STRUCTURE

Lyle E. Kirman, Cleveland Heights, and Wayne A. Kruper, Willowick, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 28, 1978, Ser. No. 900,953
Int. Cl.[2] C25D 5/36, 5/44
U.S. Cl. 204—23 15 Claims

1. A method of concurrently coating the surface of a composite bearing structure having one portion of the surface area thereof composed of an aluminum base metal and another portion of the surface area thereof composed of a ferrous base metal with an adherent layer of tin base metal, comprising:

contacting said composite structure with a mineral acid containing ions selected from the group consisting of fluoride ions, fluoride containing ions or mixtures thereof to activate the surface of said aluminum base metal; and

immersing said composite structure in an aqueous plating bath containing a mineral acid, a source of ions selected from the group consisting of fluoride ions, fluoride containing ions or mixtures thereof and a source of stannous ions with said stannous ions being present in an amount ranging from about 1 to about 75 grams per liter, for a period of time sufficient to cause tin to be deposited concurrently on said aluminum base metal surface by the exchange of aluminum ions for tin ions and on said ferrous base metal surface by means of a galvanic couple formed between said aluminum base metal and said ferrous base metal.

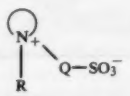
4,170,526

ELECTROPLATING BATH AND PROCESS

Hans G. Creutz, deceased, late of Yale, Mich. (by Katharina A. Creutz, administratrix), and Roy W. Herr, Troy, Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Jan. 16, 1978, Ser. No. 869,967
Int. Cl.[2] C25D 3/22
U.S. Cl. 204—55 R 6 Claims

1. An aqueous non-cyanide zinc electroplating bath having a pH of from about 2.0 to about 9.0 which electroplating bath contains an effective amount of a brightening and leveling agent comprising a bath soluble nitrogen heterocyclic quaternary having the formula:



Wherein:

Q=R_1, R_2O

R=CH_3, C_2H_5

R_1=CH_3, C_2H_5, $CH_3C_6H_4$

R_2=CH_3, C_2H_5

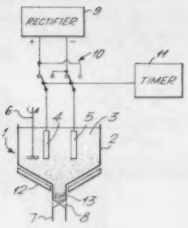
4,170,527

PRODUCTION OF ELECTROLYTIC MANGANESE DIOXIDE

Henri B. Beer, Heide Kalmthout, and Theo L. H. Muller, Wuustwezel, both of Belgium, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Filed Oct. 27, 1978, Ser. No. 955,314
Claims priority, application United Kingdom, Oct. 2, 1977, 45607/77
Int. Cl.[2] C25B 1/00
U.S. Cl. 204—96 20 Claims

1. In the manufacture of electrolytic manganese dioxide (EMD), a method of detaching the EMD from an electrode on which it has been anodically deposited,



characterized by

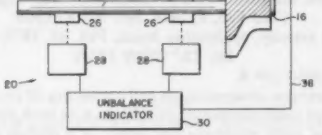
cathodically polarizing said electrode.

4,170,528

METHOD OF BALANCING A ROTATABLE ELEMENT

Will W. Mathews, Memphis, Tenn., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed May 4, 1978, Ser. No. 902,650
Int. Cl.[2] B23P 1/02; C25F 7/00
U.S. Cl. 204—129.2 2 Claims



1. A method of precision balancing a rotatable turbine wheel shaft assembly comprising the steps of:

determining the angular position of unbalance location and degree of unbalance in mass units of unbalance on a rotatable element,

machining material from said rotatable element at said unbalance location using an electrical chemical machining process in which mass material removed is proportional to the time integrated electric current flow of said process,

said turbine wheel-shaft assembly is electrically connected to a ground connection and the time-integrated current flow of said process is determined through said connection;

terminating said electrical machining process when the time-integrated current is at a value that produces the required removal of determined mass units of unbalance.

4,170,529

SYSTEM AND METHOD FOR ELECTRIC DEWATERING OF SOLIDS SUSPENSION

Mark P. Freeman, Darien, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

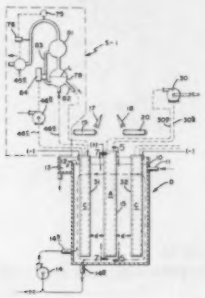
Division of Ser. No. 697,142, Jun. 17, 1976, Pat. No. 4,107,026.
This application Mar. 15, 1978, Ser. No. 886,984
Int. Cl.[2] B01D 13/02
U.S. Cl. 204—180 R 11 Claims

1. The method of dewatering a suspension of soiids in a carrier liquid, which comprises,

providing and maintaining an overchanging body of the suspension, of a predetermined at least minimum depth,

establishing in said body an electric field between a pair of opposing electrodes, the energy of said field being such as to cause solids migrating in one direction relative to the carrier liquid to form a cake layer on the electrode surface

of one of said electrodes, the other electrode having a liquid permeable surface for carrier liquid to pass therethrough,



simultaneously filtering carrier liquid under vacuum through said permeable surface, thus delivering the resulting filtrate liquid separated from the suspension,
detaching said cake material from said electrode,
and recovering the detached cake material.

4,170,530

OXYGEN CONCENTRATION CELL AND A METHOD OF PRODUCING THE SAME

Tetsuo Watanabe, Nagoya, and Shigetaka Wada, Kuwana, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Feb. 6, 1978, Ser. No. 875,566
Claims priority, application Japan, Feb. 16, 1977, 52-14915
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S **4 Claims**

1. An oxygen concentration cell consisting of an oxygen ion conductive solid electrolyte provided on its both surfaces with electrodes, each electrode consisting of a porous electrically conductive layer, which consists of a platinum group metal and contains in its pores a metal oxide formed in liter by the thermal decomposition of an oxide-forming metal compound.

4,170,531

METHOD OF PRODUCING AN OXYGEN CONCENTRATION CELL

Tetsuo Watanabe, Nagoya; Shigetaka Wada, Kuwana, and Shunzo Mase, Tobishima, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jan. 26, 1978, Ser. No. 872,636
Claims priority, application Japan, Jan. 31, 1977, 52-8717
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S **2 Claims**

1. A method of producing an oxygen concentration cell, comprising applying a solution of a compound a platinum group metal to an oxygen on conductive solid electrolyte, converting the compound of platinum group metal into an insoluble or hardly soluble compound by contacting the applied solution with ammonia or amine in the gaseous or liquid state, and thermally decomposing the insoble or hardly soluble compound into the platinum group metal to be used as the electrodes of the cell.

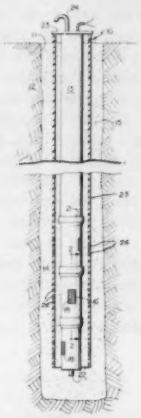
4,170,532

DEEP WELL PLATINIZED ANODE CARRIER FOR CATHODIC PROTECTION SYSTEM

Joe F. Tatum, Hattiesburg, Miss., assignor to C. E. Equipment, Inc., Hattiesburg, Miss.

Filed Apr. 11, 1978, Ser. No. 895,402
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—196 **3 Claims**

1. Apparatus for use in a deep well bore hole in a cathodic protection system for underground metallic structures comprising an elongated hollow carrier of electrically non-conductive material which is normally located within the bore hole, said carrier including an elongated imperforate first tubular member having at least one short second tubular member connected axially thereof, said second tubular member having wall structure defining an opening, said wall structure having a recessed groove extending entirely around said opening, an inert perforate anode mounted in said groove and extending entirely across said opening, said anode including an electrically stable structure which is coated with a noble metal, an



electric wire extending through said first tubular member and having one end connected to a source of DC impressed current, an anode lead wire having one end connected to said anode and the other end connected to said electric wire, and a carbonaceous material filling the space between said carrier and the walls of the bore hole and being in intimate engagement with said anode to transfer electric current from said anode to the earth, whereby electric current flows through the earth to an underground metallic structure and causes the structure to be substantially entirely cathodic.

4,170,533

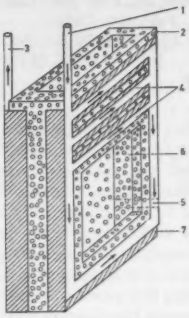
REFRACTORY ARTICLE FOR ELECTROLYSIS WITH A PROTECTIVE COATING MADE OF CORUNDUM CRYSTALS

Hanspeter Alder, Flurlingen, and Hans Boving, Corcelles, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 687,636, May 18, 1976, Pat. No. 4,049,511. This application Jul. 22, 1977, Ser. No. 818,112
Claims priority, application Switzerland, May 30, 1975, 6979/75
The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.
Int. Cl.[2] C25C *3/08*; C25D *17/02*; C25C *3/10*
U.S. Cl. 204—243 R **8 Claims**

1. An article of refractory material carrying a substantially continuous, compact, adherent protective coating consisting

essentially of corundum crystals which are needle-like in shape and which are in part intimately grown into each other and in



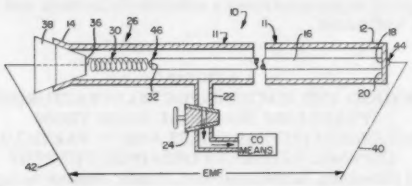
part held together by solidified aluminum oxide eutectic material.

4,170,534

APPARATUS FOR THE DIRECT CONVERSION OF SOLAR ENERGY INTO ELECTRICITY AND A COMBUSTIBLE GAS BY GALVANIC MEANS

George R. Fitterer, 825 12th St., Oakmont, Pa. 15139

Filed Jun. 23, 1977, Ser. No. 809,286
Int. Cl.[2] C25B *9/00*; H01M *8/12*
U.S. Cl. 204—248 15 Claims



1. A solid electrolyte galvanic cell for continuously generating electricity and producing predominately carbon monoxide from a reaction of oxygen and a carbon fuel, comprising:

a solid electrolyte having an oxygen ion permeability through the electrolyte in the presence of a source of oxygen at a surface of the electrolyte at electrolyte temperatures in excess of about 705° C.;

a carbon-containing fuel in electrical contact with an opposed surface of the solid electrolyte to form a galvanic cell which includes said electrolyte and said fuel;

means for heating said cell in the presence of said source of oxygen for the electrolyte to a temperature sufficient to form predominately carbon monoxide from the reaction of carbon in the carbon-containing fuel and oxygen passing through the solid electrolyte whereby electricity is simultaneously and continuously generated by the transfer of oxygen ions through the solid electrolyte at said temperatures; and

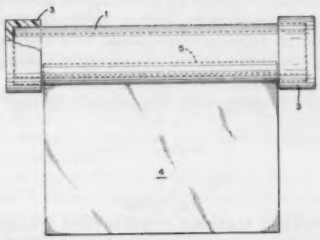
electrical circuit means forming an electrical circuit with said electrolyte and said carbon-containing fuel to receive continuously said electricity from said cell.

4,170,535

MEMBRANE SECURING DEVICE

Bronislaw B. Smura, Marcellus, N.Y., assignor to Allied Chemical Corporation, Morristown, N.J.

Filed Dec. 22, 1977, Ser. No. 863,389
Int. Cl.[2] C25B *9/00*
U.S. Cl. 204—279 3 Claims



1. An apparatus adapted to retain a membrane within an electrolytic cell comprising an elongated, hollow, cylindrical member composed of a rigid or semi-rigid, essentially chemically inert, non-conducting material, having a substantially smooth outer surface, a continuous open slit running the length of said member, both ends of said member having located thereon a cap whereby a membrane held within said slit is prevented from being withdrawn from said member, at least one of said caps being removably mounted on the end of said member.

4,170,536

ELECTROLYTIC CATHODE AND METHOD FOR ITS PRODUCTION

Keiji Kawasaki, and Tetsuo Takeshita, both of Tokyo, Japan, assignors to Showa Denko K.K., Japan

Filed Nov. 13, 1978, Ser. No. 959,782
Claims priority, application Japan, Nov. 11, 1977, 52-134771; Nov. 18, 1977, 52-137795
Int. Cl.[2] C25B *11/06, 1/34*; C25D *5/48, 3/12*
U.S. Cl. 204—290 R 10 Claims

1. A cathode for use in the electrolysis of an aqueous solution of an alkali metal halide or water, comprising a metallic cathode substrate and a powder of an at least partly developed Raney nickel alloy held on its surface dispersed and partly embedded in a nickel layer deposited thereon from a nickel plating bath.

4,170,537

METHOD OF PREPARING A DIAPHRAGM HAVING A GEL OF A HYDROUS OXIDE OF ZIRCONIUM IN A POROUS MATRIX

Robert B. Simmons, Norton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 20, 1978, Ser. No. 953,134
Int. Cl.[2] C25B *13/00, 13/04, 13/06, 13/08*
U.S. Cl. 204—295 7 Claims

1. In a method of preparing a diaphragm by contacting a porous matrix with zirconium oxychloride and thereafter with an ammonium compound whereby to hydrolyze the zirconium oxychloride to form a substantially insoluble hydrous oxide of zirconium, the improvement comprising leaching out the ammonium chloride and thereafter contacting the porous matrix with additional zirconium oxychloride whereby to deposit additional hydrous oxide of zirconium in the matrix.

4,170,538

DIAPHRAGM HAVING ZIRCONIUM AND MAGNESIUM COMPOUNDS IN A POROUS MATRIX

Robert B. Simmons, Norton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 20, 1978, Ser. No. 953,132
Int. Cl.[2] C25B *13/00, 13/04, 13/06, 13/08*
U.S. Cl. 204—295 11 Claims

1. In a method of preparing a hydrophilic matrix comprising contacting a porous matrix with a zirconium compound and converting the zirconium compound to a hydrous oxide of zirconium, the improvement comprising depositing a magnesium compound and the zirconium compound in the porous matrix and converting both compounds to oxides.

4,170,539

DIAPHRAGM HAVING ZIRCONIUM OXIDE AND A HYDROPHILIC FLUOROCARBON RESIN IN A HYDROPHOBIC MATRIX

Robert B. Simmons, Norton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 20, 1978, Ser. No. 953,133
Int. Cl.[2] C25B *13/00, 13/04, 13/06, 13/08*
U.S. Cl. 204—295 10 Claims

1. In a method of preparing a diaphragm comprising depositing a hydrous oxide of zirconium in a porous, hydrophobic fluorocarbon matrix, the improvement comprising first depositing a hydrophilic fluorocarbon resin on the surface of the porous fluorocarbon matrix and thereafter depositing the hydrous oxide in the fluorocarbon matrix.

4,170,540

METHOD FOR FORMING MICROPOROUS MEMBRANE MATERIALS

Christine A. Lazarz; Edward H. Cook, Jr., both of Niagara Falls, N.Y., and Lesleigh V. Scripa, East Hartford, Conn., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Mar. 31, 1978, Ser. No. 891,987
Int. Cl.[2] B29D *27/00;* C25B *13/08, 1/26*
U.S. Cl. 204—296 20 Claims

1. A process for the preparation of a microporous electrolytic cell separator, comprising the steps of:

(a) blending a dry fluorocarbon polymer powder and a pore forming particulate additive;
(b) adding an organic nonionic fluorosurfactant lubricant;
(c) blending said polymer powder, particulate additive and lubricant to a uniform mixture;
(d) forming said mixture into a sheet;
(e) reducing said sheet to the desired thickness by passing between rollers a plurality of times;
(f) heating said sheet to remove volatile components in the lubricant;
(g) sintering and cooling said sheet material; and
(h) removing the particulate pore forming additive forming a high porosity microporous electrolytic cell separator.

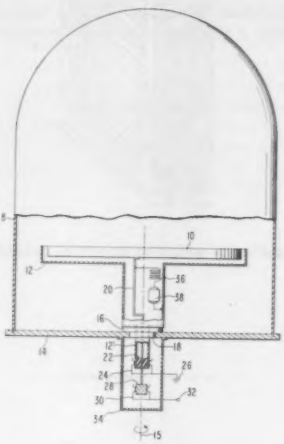
15. A chlor-alkali cell separator comprising a microporous polytetrafluoroethylene sheet having high porosity, said separator formed by blending a dry powder of polytetrafluoroethylene and a particulate pore forming additive with a nonionic fluorosurfactant lubricant to a uniform mixture, forming the mixture into a sheet of the desired thickness by sequentially rolling and rerolling said mixture, drying the sheet to remove volatile components in the lubricant, sintering the polytetrafluoroethylene, and leaching the particulate pore forming additive.

4,170,541

ROTATING RESONATOR FOR LARGE SUBSTRATE TABLES IN SPUTTERING SYSTEMS

Lawrence T. Lamont, Jr., Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 14, 1978, Ser. No. 933,298
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—298 5 Claims



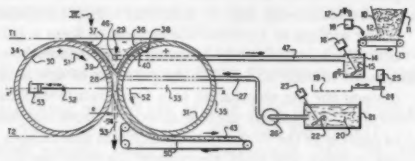
1. A sputtering apparatus for connection to a radio frequency power generator for depositing material on articles, said apparatus comprising wall means defining a portion of a vacuum enclosure, rotating electrode means adapted to support radio frequency voltage, said rotating electrode further adapted to rotate with respect to said wall means, resonating circuit means disposed to rotate with said rotating electrode means, hermetic coupling means for coupling radio frequency energy to said rotating electrode through said wall means, said coupling means maintaining a substantially hermetic seal with said wall means.

4,170,542

METHOD AND MACHINE FOR MANUFACTURING A PLATE-LIKE MATERIAL MADE FROM AGGLOMERATED PARTICLES AND IN PARTICULAR CERAMIC PRODUCTS OBTAINED THEREBY

Sten Chronberg, Arnieres-sur-Iton, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Division of Ser. No. 679,012, Apr. 21, 1976, Pat. No. 4,048,037.
This application Jun. 29, 1977, Ser. No. 811,078
Claims priority, application France, Apr. 25, 1975, 75 13091
Int. Cl.[2] C25B *7/00*
U.S. Cl. 204—300 R 4 Claims



1. A machine for preparing a plate-like material consisting of particles agglomerated together and selected from the group comprising solid particles, plastic particles and in particular clay-based particles, from a suspension in a liquid such in particular as water, said plate exhibiting a sufficient cohesive-

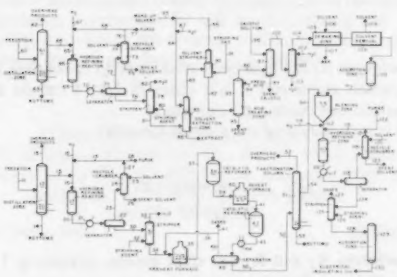
ness to enable its being worked subsequently according to any known technical processes in particular for the manufacturing of ceramic pieces, wherein the improvement consists in that said machine comprises a pair of cylinders with substantially circular cross-sections which are located very close to each other and revolved at substantially equal tangential speeds, respectively, whereas the outer surfaces of which are made from a material likely to form an electrode plate in particular of zinc type for electrophoretic purposes; a counter-electrode arranged opposite to said surfaces of said cylinders within one of the two prismatic spaces of curvilinear triangular cross-sections defined between said cylinders and their common outer tangential planes extending in parallel relation to the axial plane passing through the centre lines of said cylinders; an input for feeding said suspension such as slip into said first space adjacent to said axial plane; an enclosed space containing in sealing relationship said suspension within said first space; overflow means enabling to remove and drain away that suspension which has flown through said space; means for recycling and regenerating said suspension which receive the solution from said overflow means and feeding said input means; and means for receiving and taking up the plate built up through electrophoresis by two layers of agglomerated material deposited onto the surfaces of said cylinders and fused together substantially at said axial plane and leaving said first prismatic space while entering said second prismatic space under the effect of the continuous rotary motions of said cylinders.

4,170,543

ELECTRICAL INSULATING OIL

Thomas G. Lipscomb, II; Walter A. Morgan, and Sam R. Bethea, all of Baytown, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 3, 1975, Ser. No. 555,016
Int. Cl.[2] C10G *39/00;* H01B *3/22*
U.S. Cl. 208—14 **3 Claims**



1. An improved electrical insulating oil characterized by negative direct current impulse strength values in excess of about 200 kilovolts, positive direct current impulse strength values in excess of about 130 kilovolts, and negative gassing values of −20 μl/min. or lower; said insulating oil consisting essentially of a highly aromatic hydrocarbon oil which has been derived from a catalytic reformate and has a boiling range between about 400° F. and about 700° F., contains less than about 1.0 weight percent of polar compounds, and includes less than about 2.5 weight percent of polynuclear aromatic compounds having four or more condensed aromatic rings per molecule; and up to about 75 percent by volume of a low aromatics hydrocarbon oil which boils between about 350° F. and about 900° F. and has an aromatics content below about 20 percent by weight; said insulating oil having a viscosity at 100° F. between about 50 and about 300 Saybolt Universal Seconds, a pour point below about 15° F., and a flash point of at least about 265° F.

4,170,544

HYDROCRACKING PROCESS INCLUDING UPGRADING OF BOTTOMS FRACTION OF THE PRODUCT

Stephen J. Miller, Emeryville, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 12, 1978, Ser. No. 915,021
Int. Cl.[2] C10G *21/16*
U.S. Cl. 208—96 **14 Claims**

1. In a hydrocracking process wherein a hydrocrackable hydrocarbon feedstock is contacted with a hydrocracking catalyst under hydrocracking conditions and bottoms are separated from the resulting hydrocrackate product mixture, said bottoms containing at least one undesirable component selected from the group consisting of residual polycyclic hydrocarbons and nitrogen-containing hydrocarbon impurities, the improvement comprising:

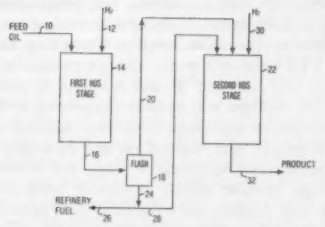
removing at least a portion of said undesirable components from said bottoms by contacting said bottoms under liquid-liquid extracting conditions with a solution of ferric chloride, said solution containing (a) at least a major portion of furfural and (b) an amount of said chloride, based by weight upon said solution, in the range of from about 0.001 to 10%, said extracting conditions including (i) a temperature in the range of from about 0° C. to 50° C., (ii) a solvent-to-feedstock volume ratio in the range of from about 0.1 to 10, and (iii) a resulting bottoms raffinate oil having, relative to said bottoms, a reduced content of said undesirable component.

4,170,545

MULTISTAGE RESIDUAL OIL HYDRODESULFURIZATION PROCESS WITH AN INTERSTAGE FLASHING STEP

James A. Frayer, Pittsburgh; Harry C. Stauffer, Cheswick, and Stephen J. Yanik, Valencia, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Oct. 20, 1977, Ser. No. 843,877
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—210 **6 Claims**



1. A process for the hydrodesulfurization of an aromatics- and asphaltene-containing feed oil to produce at least two hydrodesulfurized residual oil streams having different respective asphaltene and sulfur contents, said process employing upstream and downstream hydrodesulfurization stages containing hydrodesulfurizaton catalyst comprising Group VI and Group VIII metal on a non-cracking support at a temperature between 600° and 900° F. and a hydrogen pressure between 500 and 5,000 psi, said process comprising passing said feed oil and hydrogen though said upstream hydrodesulfurization stage to produce an upstream stage deffluent stream, passing said upstream stage effluent stream through a flash zone to separate a flash distillate stream from a flash residue stream, splitting said flash residue stream into a first flash residue portion comprising between about 10 and 75 weight percent of said flash residue stream and a second flash residue portion, removing said first flash residue porton from said process to selectively remove refractory sulfur asphaltenes from said process and to increase the concentration of more sulfur-reac-

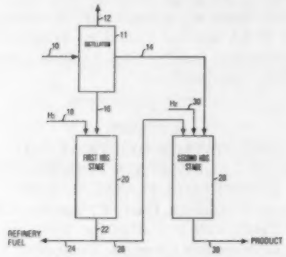
tive material in said downstream stage, passing said second flash residue portion and said flash distillate stream and hydrogen to said downstream stage, and recovering a downstream stage effluent stream, said downstream stage effluent stream containing aromatics and having a sulfur concentration at least 75 percent lower than the sulfur concentration of said feed oil, the removal of said first flash residue portion allowing the sulfur concentraton in said downstream stage effluent stream to be achieved with a relatively high aromatics concentration as compared to the aromatics concentration when achieving the same sulfur concentration by hydrodesulfurization without selective removal of refractory sulfur asphaltenes.

4,170,546

MULTISTAGE RESIDUAL OIL HYDRODESULFURIZATION PROCESS

James A. Frayer, Pittsburgh; Harry C. Stauffer, Cheswick, and Stephen J. Yanik, Valencia, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Oct. 20, 1977, Ser. No. 843,876
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—210 **6 Claims**



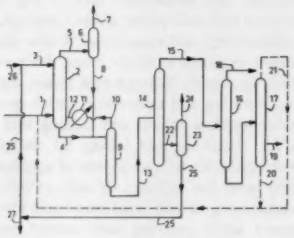
1. A process for the hydrodesulfurization of an aromatics- and asphaltene-containing feed oil to produce at least two hydrodesulfurized residual oil streams having different respective asphaltene and sulfur contents, said process employing upstream and downstream hydrodesulfurization stages containing hydrodesulfurization catalyst comprising Group VI and Group VIII metal on a non-cracking support at a temperature between 600° and 900° F. and a hydrogen pressure between 500 and 5,000 psi, said process comprising fractionating said feed oil into an asphaltene-containing residual oil and a distillate oil, passing said residual oil and hydrogen through said upstream hydrodesulfurization stage and recovering an upstream stage effluent stream containing refractory sulfur asphaltenes, said distillate oil by-passing said upstream stage and passed directly to said downstream stage, splitting said upstream stage effluent stream into a first effluent portion comprising between about 10 and 75 weight percent of the normally liquid material in said upstream stage effluent stream and a second effluent portion, removing said first effluent portion from said process to selectively remove refractory sulfur asphaltenes from said process and to increase the concentration of more sulfur-reactive material in said downstream stage, passing said second effluent portion together with said distillate oil and hydrogen through said downstream stage, and recovering a downstream stage effluent stream, said downstream stage effluent stream containing aromatics and having a sulfur concentration which is at least 75 percent lower than the sulfur concentration of said feed oil, the removal of said first effluent portion allowing the sulfur concentration in said downstream effluent stream to be achieved with a relatively high aromatics concentration as compared to the aromatics concentration when achieving the same sulfur concentration by hydrodesulfurization without selective removal of refractory sulfur asphaltenes.

4,170,547

PROCESS FOR THE SEPARATION OF DIENIC OR AROMATIC HYDROCARBONS FROM HYDROCARBON FRACTIONS CONTAINING THEM WITH THE AID OF SULFONAMIDES

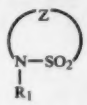
Martial Atlani, Paris; Vincent Corso, Versailles; Claude Wakselman, Villebon; Roben Loutaty, and Charles Yacono, both of Le Havre, all of France, assignors to Compagnie Francaise de Raffinage, Paris and Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, both of, France

Filed Oct. 25, 1978, Ser. No. 954,618
Int. Cl.[2] C10G *21/20, 21/22*
U.S. Cl. 208—326 **6 Claims**



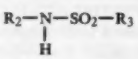
1. A process for the separation of dienic hydrocarbons from hydrocarbon fractions containing same, which comprises the step of extracting said fractions with at least one sulfonamide solvent, said sulfonamide being selected from the group consisting of:

(a) compounds A of the general formula:



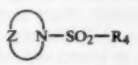
wherein R_1 is a hydrogen atom or alkyl containing 1 to 4 carbon atoms and Z is a chain of 2 to 4 carbon atoms which can contain a heteroatom;

(b) compounds B of the general formula



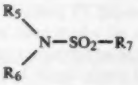
wherein R_2 and R_3 are alkyl groups containing 1 to 4 carbon atoms;

(c) compounds C of the general formula



wherein R_4 is an alkyl group containing 1 to 4 carbon atoms and Z is a chain of from 2 to 5 carbon atoms which can contain a heteroatom; and

(d) compounds D of the general formula



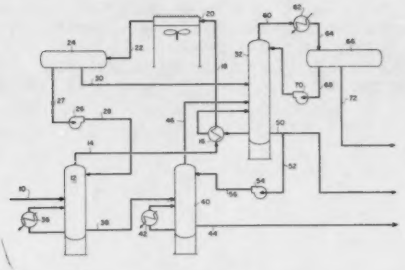
wherein R_5, R_6 and R_7 are alkyl groups containing 1 to 4 carbon atoms.

4,170,548

ENERGY EFFICIENT DISTILLATION PROCESS

Ralph G. Ruth, Tulsa, Okla., assignor to Dresser Engineering Company, Tulsa, Okla.

Filed Nov. 4, 1977, Ser. No. 848,612
Int. Cl.[2] B01D *3/14*; C10G *7/00*
U.S. Cl. 208—351 3 Claims



1. A process for separation of two close homologous isomers boiling point components contained in a multi-component hydrocarbon feed stream which comprises:

distilling the feed stream in a first column, under moderate reflux conditions, to produce a relatively light, totally condensed, fraction containing substantially all of the more volatile close boiling point component along with part of the less volatile close boiling point component and a bottoms product;

distilling the relatively light fraction from the first column in a second column to produce an overhead product consisting substantially of the more volatile close boiling point component and a bottoms product consisting substantially of the less volatile bottoms product component;

feeding the bottoms product from the first column to a third column to produce an overhead vapor consisting substantially of the less volatile close boiling point component;

passing the overhead total vapor from the third column directly to the second column to supply part of the reboiling energy requirement for said second column; and

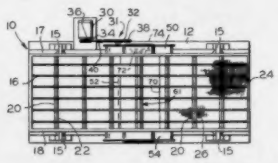
recycling a portion of the bottoms product from the second column for use as reflux in the third column.

4,170,549

VIBRATING SCREEN APPARATUS

Louis W. Johnson, 345 Palomino Dr., Eugene, Oreg. 97401

Continuation of Ser. No. 638,535, Dec. 8, 1975, abandoned. This application Sep. 6, 1977, Ser. No. 830,624
Int. Cl.[2] B07B *1/42*
U.S. Cl. 209—363 13 Claims



1. In a vibrating screen apparatus,

screening means,

a plurality of unbalanced shaft assemblies for vibrating said screening means,

a plurality of intermeshing gears drivingly interconnecting the shaft assemblies,

one of said gears being an annular gear,

gear hub means fitting in said one gear,

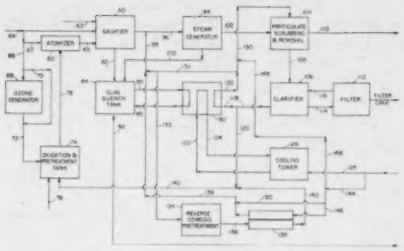
and releasable means releasably coupling said annular gear to said gear hub means for adjustment of the phase relationship of the shaft assemblies.

4,170,550

PROCESS FOR REDUCING AQUEOUS EFFLUENTS CONTAINING ENVIRONMENTALLY UNACCEPTABLE COMPOUNDS FROM A PROCESS FOR GASIFYING CARBONACEOUS MATERIALS

John F. Kamody, Irwin, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Mar. 30, 1978, Ser. No. 891,686
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—23 H 4 Claims



1. A process for reducing the quantity of foul aqueous effluent containing ammonia or hydrogen cyanide, or compounds thereof, or sulfur compounds or salts or compounds of heavy metals discharged from a slagging-type gasification process for carbonaceous material where oxygen or oxygen-containing gas is used as the gasifying medium to produce a raw gas containing mostly carbon monoxide and hydrogen and a residue slag where the raw gas is treated after it leaves the gasifier with an aqueous stream to remove particulates from the raw gas and to cool the raw gas, comprising:

(a) clarifying the aqueous stream after it has been used to remove particulates from the raw gas and to cool the raw gas after which it is a foul aqueous effluent containing ammonia, hydrogen, cyanide, compounds thereof, compounds of sulfur, or salts and compounds of heavy metals or mixtures thereof, and particulates of carbon to remove the particulates;

(b) cooling the foul aqueous effluent;

(c) splitting the cooled clarified foul aqueous effluent into two portions wherein said first portion is about equal to the net amount of water condensed from the raw gas plus any amounts of fresh water added to the gasification process, and wherein the second portion is the remaining amount of foul aqueous effluent;

(d) treating the first portion of foul aqueous effluent by reverse osmosis to concentrate any dissolved compounds or salts of ammonia, hydrogen cyanide, sulfur, or heavy metal or mixtures thereof;

(e) pretreating the concentrated foul aqueous effluent by ozonation to enhance oxidation of ammonia, hydrogen cyanide, compounds thereof, sulfur compounds, or salts and compounds of heavy metals or mixtures thereof in the gasifier;

(f) recycling the pretreated, concentrated foul aqueous effluent to the gasifier in an amount not exceeding 0.8 pounds per pound of carbonaceous material whereby the ammonia, hydrogen cyanide or compounds and mixtures thereof are transformed into environmentally innocuous gaseous compounds while simultaneously the dissolved compounds of ammonia, hydrogen cyanide, sulfur and heavy metals or mixtures thereof are recovered from the gasifier in an environmentally acceptable form with the residue from the gasifier, and sulfur compounds are transformed into gaseous compounds that can be recovered with gaseous sulfur compounds usually present in the raw gas from

the gasifier, said recycled pretreated foul aqueous effluent being atomized with a portion of the oxygen used for entrainment of the carbonaceous material conveyed into the gasifier;

(g) recycling the second portion of cooled clarified foul aqueous effluent to the aqueous stream used to remove particulates from the raw gas and to cool the raw gas.

4,170,551

WASTE OIL RECOVERY UNIT

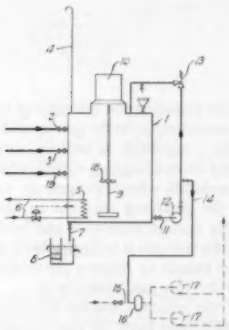
David Honour, London, England, assignor to The British Petroleum Company Limited, London, England

Filed Nov. 14, 1977, Ser. No. 850,914

Claims priority, application United Kingdom, Nov. 18, 1976, 48076/76

Int. Cl.² C02B *9/02*; E02B *15/04*

U.S. Cl. 210—27 **8 Claims**



4. A method of treating waste oil comprising: introducing said waste oil into a tank; holding said waste oil in the tank at above atmospheric temperature to allow water to separate from the waste oil; withdrawing water from said tank through an outlet and passing said water through, thereafter agitating the contents of the tank to suspend and disperse non-dissolved solids and liquids; stopping the agitation; then recirculating the contents of the tank through an external pipe; bleeding off waste oil from the external pipe; and passing said waste oil to a ship's boiler fuel supply line.

4,170,552

METHOD FOR COALESCING MERCURY PARTICLES

Gianni Generini, Ravenna, Italy, assignor to Anic S.p.A., Palermo, Italy

Filed Jun. 23, 1977, Ser. No. 809,439

Claims priority, application Italy, Jul. 2, 1976, 24984 A/76

Int. Cl.² C02B *9/00*; C02C *5/00*

U.S. Cl. 210—42 S **3 Claims**

1. A method for the separation of particles of elemental mercury from an aqueous medium, said method comprising subjecting said medium to a magnetic field having a strength of at least 6000 Gauses to cause coalescense of the elemental mercury into drops of mercury that can be separated from said medium by mechanical means and thereafter mechanically separating from said medium the drops of elemental mercury.

4,170,553

PROCESS AND APPARATUS FOR THE CONTROLLED FLOCCULATING OR PRECIPITATING OF FOREIGN SUBSTANCES FROM A LIQUID

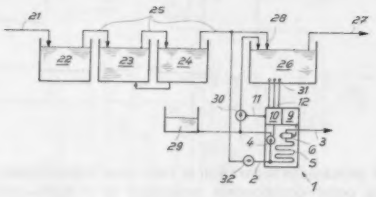
Helmut Lang, Stuttgart; Horst Overath, Niederwalluf, and Heinz-Werner Priester, Bochum-Weitmar, all of Fed. Rep. of Germany, assignors to GST-Regeltechnik GmbH, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,367

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1977, 2704080; Feb. 5, 1977, 2704816

Int. Cl.² C02B *1/20*

U.S. Cl. 210—49 **10 Claims**



1. Process for the controlled flocculation or precipitation of foreign substances from a liquid to be treated by addition of a flocculating agent comprising the steps of: adding the flocculating agent in dosaged amount to at least a portion of the liquid to be treated, measuring the turbidity of the flocculation or precipitation caused thereby in the portion and preventing the settling of the flocculated or precipitated foreign substance while the turbidity measurement is being effected, determining from the measurements of turbidity the quantity of flocculating agent which produces the maximum amount of turbidity where the settling is prevented, computing an optimum amount of flocculating agent as a function of the quantity of flocculating agent which produces said maximum value, and adding the optimum amount of flocculating agent to the liquid to be treated.

4,170,554

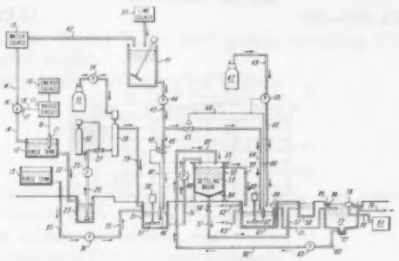
WASTEWATER TREATMENT METHOD

Ivan G. Freshcorn, Kenton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Continuation of Ser. No. 427,992, Dec. 26, 1973, abandoned. This application Jul. 2, 1975, Ser. No. 592,512

Int. Cl.² C02C *5/02*

U.S. Cl. 210—50 **2 Claims**



1. A wastewater treatment method, including the steps of originating separate streams of a chromium contaminated water and a fluoride contaminated water, the chromium contaminant being in a hexavalent form, subjecting the chromium contaminated water to action converting the hexavalent chromium to trivalent chromium, admitting the acted upon chromium contaminated water and the fluoride contaminated water to a common treatment chamber, adding to the mixture

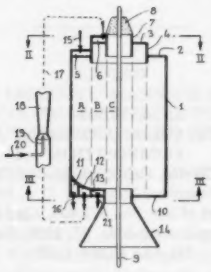
in said common treatment chamber an alkaline material precipitating contained chromium as chromium hydroxide and precipitating contained fluoride as calcium fluoride, controlling addition of the alkaline material to raise the PH level of the mixture to a value sufficient to establish the alkalinity thereof but insufficient to cause the trivalent chromium to revert to hexavalent chromium, conducting the mixture out of said common treatment chamber to a settling basin where solids formed by the precipitating action descend to a lower part thereof, extracting relatively clear liquids from an upper part of said basin and directing them to a clarifier having an outlet for relatively clear liquids to a place of discharge, restricting solids slurry flow from a lower part of said clarifier to a return to said settling basin, the return to said settling basin being direct and in by-passing relation to said common treatment chamber, and withdrawing solids formed sludge from a lower part of said settling basin for disposal.

4,170,555

METHODS AND APPARATUS FOR CENTRIFUGAL TREATMENT OF FLUIDS CONTAINING IMPURITIES IN SUSPENSION

Jean-Francois Vicard, Lyons, France, assignor to Societe Lab, Villeurbanne, France

Filed Nov. 14, 1978, Ser. No. 960,802
Claims priority, application France, Nov. 22, 1977, 77 35680
Int. Cl.[2] B01D *45/16*
U.S. Cl. 210—74 **11 Claims**



1. In a process for the centrifugal treatment of liquid or gaseous fluids containing impurities in suspension, of the type in which the fluid to be treated is injected tangentially in a first end of an apparatus of circular transverse section in which this fluid forms a first, substantially cylindrical rotating layer, whilst at the other end, and starting from the periphery, a fraction containing heavy impurities is collected, then clearer fluid, then possibly a fraction containing impurities lighter than the fluid, it being provided to recycle at least one fraction of the fluid leaving the apparatus by tangential injection into the first end thereof, the fraction to be recycled independently of the initial fluid to be treated is injected at a point located at a radial distance different from that of the point of injection of said fluid, so as to create in the apparatus at least one second, substantially cylindrical layer concentric to the first, in contact therewith and rotating in the same direction substantially according to the same law of variation of the linear speed as a function of the radius.

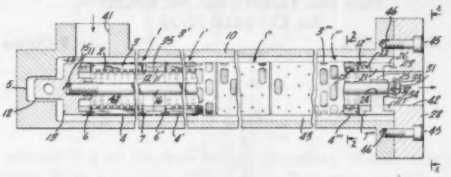
4,170,556

FILTER ELEMENTS AND FILTER ASSEMBLIES WITH THERMAL SEAL

David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed May 21, 1973, Ser. No. 361,931
Int. Cl.[2] B01D *35/18, 29/04*
U.S. Cl. 210—181 **17 Claims**

1. A filter assembly having a filter element in sealing relationship in the assembly through a seal that is thermally expanded at operating temperatures, comprising, in combination, a housing; a fluid chamber in the housing; a fluid inlet and a fluid outlet in the housing in flow communication with the fluid chamber; a cylindrical filter element disposed in the fluid chamber across the line of flow of fluid from the inlet to the outlet through the filter assembly and having a filter sheet in the form of a cylinder whose open ends are capped by end caps having open central passages therethrough; the thermally expanded seal being effected between components consisting of a first cylindrical sealing component operatively associated with each of the end caps of the filter element comprising an annular axial flange extending axially and outwardly from the end caps about the central passages thereof; and a second cylindrical sealing component operatively associated with the filter housing and comprising cylindrical adaptors having on one side a first annular recess into which the annular flanges of the end caps fit; the end cap annular flanges and annular adaptor together constituting first and second thermally sealing components having cylindrical and concentric portions whose



opposed mating cylindrical concentric side surfaces are side-to-side sealing surfaces, one adaptor having on its other side a second annular recess; an annular projection on the housing extending into the second annular recess; the second adaptor and annular recess and the housing projection together constituting another set of first and second thermally sealing components having cylindrical and concentric portions whose opposed mating cylindrical concentric side surfaces are side-to-side sealing surfaces; and another adaptor having on its other side a portion keyed with a mating portion on the housing to locate the other side of the filter element with respect to the housing; there being a small clearance between each set of such cylindrical sealing surfaces within the range from about 0.0004 to about 0.002 inch at a first relatively lower nonoperating temperature, and a leak-tight seal between each set of such cylindrical sealing surfaces upon radial expansion of the sealing components at a second relatively higher operating temperature, each of the first and second cylindrical sealing components of each thermal seal having a differential thermal expansion coefficient ΔK_t larger than about 1.5×10^{-6} per °C.

4,170,557

PROCESS AND COMPOSITION FOR IMPARTING ANTI-SOIL REDEPOSITION AND SOIL RELEASE PROPERTIES TO POLYESTER TEXTILE MATERIALS

Francis W. Marco, Pauline, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 11, 1978, Ser. No. 895,165
Int. Cl.[2] D06M *13/10*
U.S. Cl. 252—8.6 **9 Claims**

1. A method for improving the particulate redeposition properties of a polyester textile material while imparting soil release properties to same which comprises:

(a) forming an aqueous admixture consisting essentially of from about 0.0001 to about 10 weight percent of a cellulose ether soil release agent and an effective amount of an anti-redeposition agent selected from the group consisting of citric acid and acidic acrylic copolymers containing from about 10 weight percent to about 90 weight percent of the acid constituent, such being calculated as acrylic acid, said effective amount being that amount to provide a ratio of the anti-redeposition agent to the cellulose ether soil release agent of from about 1.5:1 to about 50:1;

(b) applying said aqueous admixture to the polyester textile material in an amount sufficient to substantially wet the polyester textile material and provide at least about 0.0001 weight percent of said hydroxy ether cellulose soil release agent on the textile material and at least about 0.001 weight percent of said anti-redeposition agent on the textile material;

(c) drying the wetted textile material to remove substantially all the water therefrom; and

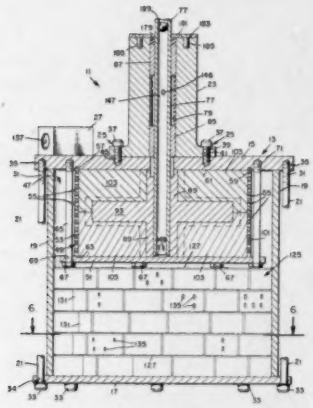
(d) recovering a resulting treated textile material.

4,170,558

CENTRIFUGAL LIQUID CLEANER

Lawrence L. Kerby, 1604 Van Horne La., Redondo Beach, Calif. 90278

Filed Dec. 12, 1977, Ser. No. 859,387
Int. Cl.[2] B01D *21/26*
U.S. Cl. 210—232 **9 Claims**



1. A centrifugal cleaner for removing contaminant matter from a liquid host, comprising:

a housing having inlet and outlet openings therein and having an elongated shaft rotatably mounted and extending through a wall thereof, a portion of said shaft extending outside said housing, including means for coupling said shaft to a source of rotational power;

an impeller structure within said housing and fixedly attached to that portion of said shaft extending within said housing, said impeller having a plurality of radially projecting blades extending an equal distance from the axis of rotation of said shaft;

a cage enclosing said impeller and fixedly mounted within said housing, said cage having a cylindrical side wall coaxial with said axis of rotation and dimensioned such that its inner wall surface is immediately adjacent but not in contact with the outer peripheral edges of said blades, said side wall being spaced from the inner wall of said housing and including a plurality of spaced apertures therethrough, said cage including spaced transverse walls generally perpendicularly to the axis of said cylindrical side wall and having inner surfaces immediately adjacent the side edges of said blades, said cage further including inlet and outlet passages respectively providing fluid communication between said inlet and outlet openings in said housing and the interior of said cage; and

a stationary sedimentation section disposed below said cage within said housing.

4,170,559

HOLLOW FIBER SEPARATORY DEVICE

Thaddeus F. Kroplinski, Bound Brook, and Barton C. Case, Howell, both of N.J., assignors to N L Industries, Inc., New York, N.Y.

Division of Ser. No. 739,380, Nov. 5, 1976, abandoned. This application Mar. 31, 1977, Ser. No. 783,086
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 A **9 Claims**

4. A hollow fiber separatory device comprising a hollow fiber bundle consisting of a plurality of fine hollow fibers whose end portions are potted in a tube-sheet and whose open fiber ends terminate in a tube-sheet face, the resulting bundle being sealed within a casing to form a separatory cell having one or more fluid ports which allow for the passage of one fluid through the fibers and another around the fibers without mixing of the two fluids, said tube-sheet consisting essentially of a cured polyurethane composition comprising the reaction product of: (1) the product of the reaction of (a) a polyester prepared from bifunctional ingredients including at least one dibasic carboxylic acid and at least one bifunctional reactant in which the functional groups are hydroxy groups, said polyester having a hydroxyl number from 40–100 and an acid number from 0–7, and (b) an arylene diisocyanate, and (2) a curing agent consisting essentially of an ester of a polyhydric alcohol of two or three hydroxy groups and a hydroxy and/or epoxy aliphatic acid of at least 12 carbon atoms.

4,170,560

LUBRICATING OIL ANTIOXIDANT ADDITIVE COMPOSITION

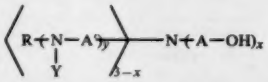
Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 672,806, Apr. 1, 1976, Pat. No. 4,086,172. This application Mar. 27, 1978, Ser. No. 890,878
Int. Cl.[2] C10M *1/38*
U.S. Cl. 252—47.5 **11 Claims**

1. An additive composition for use in crankcase lubricating oils comprising:

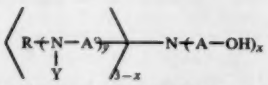
(1) an oil-soluble antioxidant selected from aromatic or alkyl sulfides and polysulfides, sulfurized olefins, sulfurized carboxylic acid esters, and sulfurized ester-olefins, and

(2) an oil-soluble hydroxy amine of the formula:



wherein A and A′ are C_2–C_{10} alkylene, R is C_1–C_{30} alkyl, Y is H, C_1–C_6 alkyl of —A—OH, y is 0, 1 or 2, and x is 1 or 2.

11. A method for inhibiting the oxidation of a lubricating oil which comprises adding to said lubricating oil from 0.25 to 10 percent weight of (1) an oil-soluble antioxidant selected from aromatic or alkyl sulfides and polysulfides, sulfurized olefins, sulfurized carboxylic acid esters and sulfurized ester-olefins, and from 0.001 to 5% weight of (2) an oil-soluble hydroxy amine of the formula



wherein A and A′ are C_2–C_{10} alkylene, R is C_1–C_{30} alkyl, Y is H, C_1–C_6 alkyl of —A—OH, y is 0, 1 or 2, and x is 1 or 2.

4,170,561

LUBRICATING COMPOSITIONS WITH LACTAM OR THIOLACTAM-CONTAINING COPOLYMERS

Gilbert Chapelet, Bron; Hubert Knoche, Meyzieu, and Gilbert Mariè, Pau, all of France, assignors to Entreprise de Recherches et d'Activities Petrolieres (E.R.A.P.), Paris, France

Division of Ser. No. 638,521, Dec. 8, 1975, Pat. No. 4,092,255.
This application Mar. 15, 1978, Ser. No. 886,644
Claims priority, application France, Dec. 12, 1974, 74 40947; Dec. 12, 1974, 74 40948
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—51.5 A 14 Claims

1. A lubricating composition comprising a major proportion of a lubricating oil and from about 0.2 to 10% by weight based on the weight of said oil, of an oil-soluble polymer additive having a reduced viscosity, measured as a 0.1% solution in decalin at 135° C., between about 0.5 and 2, and a polydispersity less than 5 wherein said polymer additive is an olefinic copolymer containing, by weight, x% units of ethylene, y% units of a mono-olefin having 3 to 6 carbon atoms or of a mono-olefin having 3 to 6 carbon atoms and a non-conjugated diene, the proportion of units resulting from the diene being lower than or equal to 20%, and z% units of one or more monomers of a lactam or a thiolactam having from 4 to 15 nuclear carbon atoms, the values of x, y and z being such that $5<x<75$, $5<y<85$ and $0.1<z<20$ with the proviso that $x+y+z=100$, said copolymer thereby improving the viscosity index (VI_E) of said oil and dispersing the slurry it may contain.

4,170,562

PHENOL MODIFIED MANNICH REACTION PRODUCTS FROM OXIDIZED POLYMERS

C. Thomas West, Naperville, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Feb. 15, 1978, Ser. No. 877,875
Int. Cl.[2] C10M *1/32, 3/26;* C08F *210/100;* C08C *19/22*
U.S. Cl. 252—51.5 A 7 Claims

1. A process of producing Mannich compound which comprises reacting a high molecular weight oxidized amorphous addition polymer of essentially olefinically unsaturated monomers, a formaldehyde yielding reactant, at least one amine selected from the group consisting of alkyl primary or secondary aliphatic monoamines having from about 2 to about 12 carbon atoms and a polyalkylene polyamine of the general formula: $NH_2—[(CH_2)_zNH]—_xH$ wherein z is an integer from about 2 to about 6 and x is an integer from about 1 to about 10 and a phenolic compound, wherein the phenol compound is present at about 0.01 to 25.0 weight percent based on the polymer.

4,170,563

LIQUID ELECTROGRAPHIC DEVELOPER COMPRISING POLYMERIC PHOSPHONATE DISPERSING AGENT

Stewart H. Merrill, Rochester, and Domenic Santilli, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 12, 1977, Ser. No. 824,135
Int. Cl.[2] G03G *9/12*
U.S. Cl. 252—62.1 L 12 Claims

1. A liquid electrographic developer comprising colorant particles dispersed in an electrically insulating carrier liquid and a soluble vinyl polymeric dispersing agent containing a phosphonate moiety wherein said moiety is a phosphonic acid group, a phosphonic salt group, a half-ester of a phosphonic acid group, or a salt of a half-ester of a phosphonic acid group, the solubility ratio of said polymeric dispersing agent in the carrier liquid being at least about 0.825.

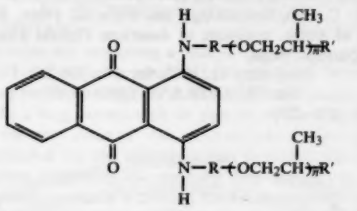
4,170,564

REFRIGERANTS COLORED FOR LEAK INDICATION WITH SUBSTITUTED ANTHRAQUINONE DYES

Ralph N. Brendle, Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 6, 1977, Ser. No. 839,850
Int. Cl.[2] C09K *5/04*
U.S. Cl. 252—68 12 Claims

1. A leak detecting refrigeration composition for vapor compression heat transfer systems consisting essentially of a refrigeration liquid and a minor effective amount of a substantially hydrophobic polyoxypropyleneamine substituted anthraquinone dye or mixture of such anthraquinone dyes having the structure



wherein R is an alkylene moiety containing at least 1 carbon atom, R′ is a member of the group consisting of NH_2, OH, NCOR″, OCOR″, and OR″ wherein R″ is an alkyl moiety containing from 1 to about 18 carbon atoms, and wherein n is an integer having an average value of at least about 6, said substantially hydrophobic polyoxypropyleneamine substituted anthraquinone dye being soluble in said refrigeration liquid.

4,170,565

SUBSTRATE ARTICLE FOR CLEANING FABRICS

Daniel J. Flesher, Springdale, and Gary W. Kingry, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 25, 1977, Ser. No. 781,378
Int. Cl.[2] A47L *13/17;* C11D *17/00, 17/04*
U.S. Cl. 252—93 4 Claims

1. An article useful in a process for cleaning fabrics, yielding sequential release of surfaceactive components, consisting essentially of an effective amount of a surface-active composition comprising from about 5 to 95% of a water-soluble surface-active agent contained between two layers of a water-insoluble, wet-strength substrate, at least one of said layers having areas of different air permeability, at least a substantial portion of said layers having an air permeability of at least about 30 cubic ft. per minute per sq. ft., and a portion of said layers having an air permeability of less than about 10 cubic ft. per minute per sq. ft.

4,170,566

CARBOXYLIC/SULFONIC ANHYDRIDES AS PEROXYGEN ACTIVATORS

Joseph H. Finley, Metuchen; John H. Blumbergs, Highland Park, and Clifford A. Erickson, Princeton, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 838,902, Oct. 3, 1977, Pat. No. 4,110,074.
This application Apr. 10, 1978, Ser. No. 894,774
Int. Cl.[2] C11D *7/18, 7/56*
U.S. Cl. 252—99 8 Claims

1. A bleaching composition consisting essentially of a peroxygen bleaching compound and as a peroxygen activator, a carboxylic-sulfonic anhydride of the formulae:

$$R_1—(SO_2OC(O)—R_2)_n \text{ and } (R_1—SO_2OC(O))_n—R_2$$

wherein n is an integer of 1 to 3; each of R_1 and R_2, which may

be alike or different, is selected from the class consisting of a 1 to 3 valent hydrocarbon radical derived from an alkane of 1 to 16 carbon atoms, a cycloalkane of 3 to 7 carbon atoms and an arene of 6 to 12 aromatic carbon atoms while taken together R_1 and R_2 can complete an o-phenylene or an o-naphthalene ring, said hydrocarbon radicals optionally bearing 1 to 3 substituents selected from the class consisting of alkoxy of 1 to 16 carbon atoms on the arene, aliphatic carboxamido of 1 to 16 carbon atoms on the arene, alkyl of 1 to 16 carbon atoms on the arene, benzamido on the arene, nitro, chlorine, bromine and fluorine.

4,170,567

PHOTOCHROMIC MERCURY COMPLEXES OF ASYMMETRICAL DIARYLTHIOCARBAZONES

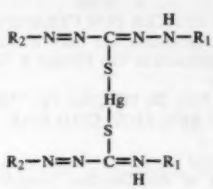
Nori Y. C. Chu, Southbridge, and Peter G. Piusz, Brimfield, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed May 12, 1977, Ser. No. 796,213

Int. Cl.[2] G02B *5/23*; C09B *45/00*

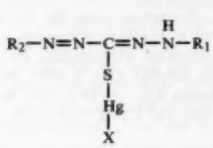
U.S. Cl. 252—300 **32 Claims**

1. An optically clear plastic, photochromic lens containing a photochrome selected from the group consisting of photochromic, asymmetrical mercury bis complexes of diarylthiocarbazones having absorption maxima less than about 470 nm, and having the formula:



wherein one of R_1 and R_2 is a radical selected from the group consisting of substituted and unsubstituted aryl groups and the other one of R_1 and R_2 is an aryl group substituted in the ortho position with a radical selected from the group consisting of sulfonyl, alkylsulfonyl (C_1–C_6), carboxy, carboxy alkyl (C_1–C_6), aldehyde, keto alkyl (C_1–C_6), cyano, trifluoromethyl, trifluoromethylsulfonyl, and perfluorothioalkoxy (C_1–C_6).

8. An optically clear plastic, photochromic lens containing a photochrome selected from the group consisting of photochromic, asymmetrical mercury mono complexes of diarylthiocarbazones having an absorption maxima less than about 470 nm, and having the formula:



wherein X is selected from the group consisting of halogen, alkyl (C_1–C_{10}), and aryl (C_6–C_{12}), wherein one of R_1 and R_2 is selected from the group consisting of substituted and unsubstituted aryl groups and the other one of R_1 and R_2 is an aryl group substituted in the ortho position with a radical selected from the group consisting of sulfonyl, alkylsulfonyl (C_1–C_6), carboxy, carboxy alkyl (C_1–C_6), aldehyde, keto alkyl (C_1–C_6), cyano, trifluoromethyl, perfluorothioalkoxy (C_1–C_6) and trifluoromethylsulfonyl.

4,170,568

POLYMERIZATION CATALYST

Kenneth C. Kirkwood, Larbert, Scotland, assignor to BP Chemicals Limited, London, United Kingdom

Continuation-in-part of Ser. No. 772,681, Feb. 28, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,639

Claims priority, application United Kingdom, Mar. 1, 1976, 8031/76

Int. Cl.[2] C08F *4/02, 4/10*

U.S. Cl. 252—430 **12 Claims**

1. a process for the production of a supported Ziegler catalyst A (I) forming a support material by heating the magnesium salt of an organic carboxylic acid under conditions so that at least part thereof is converted to magnesium oxide, and (II) impregnating the said support material with the crude product of reacting together (a) a transition metal compound which is a halide, haloalkoxide or oxyhalide of titanium, vanadium or zirconium and (b) an aliphatic alcohol.

4,170,569

AMPHORA AGGREGATES AND THE PROCESS FOR THEIR PREPARATION

Daniel R. Herrington, Chesterland, and Albert P. Schwerko, Solon, both of Ohio, assignors to Standard Oil Company

Division of Ser. No. 866,450, Jan. 3, 1978. This application Jun. 7, 1978, Ser. No. 913,266

Int. Cl.[2] B01J *35/08, 37/00*

U.S. Cl. 252—448 **20 Claims**

1. Aggregates having a substantially spherical shape, a void center therein, a first cavity in the external surface communicating with the said void center, a second cavity 180° from said first cavity communicating with said void center prepared by:

(a) preparing a slurry, the slurry comprising a suspending liquid and distinct particles of a first solid suspended in said liquid;

(b) preparing a particle bed consisting of particles of a second solid;

(c) forming droplets of the slurry;

(d) dropping the droplets of the slurry onto said particle bed in such a manner that the droplets are not immersed in the particle bed;

(e) freezing said droplets on said particle bed to enhance the rate of drying on the external surface of the slurry droplets and to retard the rate of drying in the interior of the slurry droplets; and

(f) removing at least part of said suspending liquid from said frozen droplets in said particle bed to form said amphora catalyst.

4,170,570

PROCESS FOR PREPARING OXIDATION CATALYSTS

Robert J. Zagata, Seven Hills; Wilfrid G. Shaw, Lyndhurst, and David R. Woodbury, Bedford Hts., all of Ohio, assignors to Standard Oil Company (Ohio), Ohio

Filed Jan. 3, 1978, Ser. No. 866,572

Int. Cl.[2] B01J *27/14, 29/16, 29/00, 29/10*

U.S. Cl. 252—437 **9 Claims**

1. A process for preparing an attrition-resistant molybdenum-containing solid oxidation catalyst comprising:

forming the oxides or oxide complexes of the active catalytic components; heat-treating said catalytic oxides or oxide complexes in an oxidizing atmosphere at a temperature of from 175° to 500° C.; refluxing said heat-treated catalytic oxides in an aqueous slurry of a carrier material; ball milling said heat-treated catalytic oxides; and subjecting the resulting ball-milled catalytic oxides-carrier composition to a second heat treatment at a temperature in the range of 200° to 500° C. in an oxidizing atmosphere.

4,170,571

NOVEL COMBUSTION CATALYST

James S. Ritscher, Ossining, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,835
Int. Cl.[2] B01J *29/06, 8/00;* C10H *23/00*
U.S. Cl. 252—455 Z 8 Claims

1. ZSM-5 type zeolite compositions suitable for use in oxidative combustion of hydrocarbons and oxygenated hydrocarbons having in the dehydrated state a composition in terms of mole ratios of oxides as:

$$1.6\text{–}2.0\ Cu^{++}O{:}0\text{–}0.2\ M_{2/n}O{:}Al_2O_3{:}20\text{–}100\ SiO_2$$

wherein M is at least one cation having a valence of "n", said composition having a characteristic X-ray powder diffraction pattern containing at least the d-spacings of Table I.

4. Process for preparing the compositions of claim 1 which comprises contacting and ion-exchanging a ZSM-5 type zeolite having at least 80 percent of its framework alumina tetrahedra associated with alkali metal cations with an aqueous solution of divalent copper cations to the extent that at least 80 percent of the said framework alumina tetrahedra are associated with a copper-containing cation, dehydrating said ion-exchanged zeolite whereby monovalent zeolitic copper cations are formed, and thereafter contacting the ion-exchanged form of the zeolite with an oxidizing atmosphere to convert Cu^{+} zeolitic cations to Cu^{++} cations.

4,170,572

OXIDATION CATALYST PREPARED WITH NH_3

Abraham N. Kurtz, Charleston; Robert W. Cunningham, Saint Albans, both of W. Va., and Alfred W. Naumann, Monsey, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 407,577, Oct. 18, 1973, Pat. No. 4,111,983.
This application May 16, 1978, Ser. No. 906,584
Int. Cl.[2] B01J *29/06, 23/16*
U.S. Cl. 252—455 R 6 Claims

1. An oxidation catalyst containing the elements Mo, V, W, Cr and Cu in the ratio

$$Mo_a\ V_b\ W_c\ Cr_d\ Cu_e$$

wherein
a is 12,
b is 1 to 6,
c is 1 to 6,
d is 0 to 2, **and**
e is 1 to 4, and
which has been thermally activated in an atomosphere containing ammonia at a temperature of about 350 to ≦450° C. for about 2 to 20 hours.

2. A catalyst as in claim 1 which is supported on an inert support.

3. A catalyst as in claim 2 in which said support is silica, alumina or mixtures thereof.

4,170,573

RARE EARTH AND PLATINUM GROUP METAL CATALYST COMPOSITIONS

Michael V. Ernest, Baltimore, and James M. Maselli, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 7, 1978, Ser. No. 894,316
Int. Cl.[2] B01J *21/04, 23/10, 23/40*
U.S. Cl. 252—462 28 Claims

1. A catalyst composition comprising (a) a composite of from about 1 to about 25 weight percent ceria, from about 1 to about 10 weight percent lanthana, and from about 65 to about 98 weight percent alumina, said composite prepared by depositing a solution of a cerium compound on a calcined admixture of a lanthanum compound and an aluminum compound and calcining the composite; and (b) a catalytically-effective amount of one or more platinum group metals deposited on the calcined composite.

4,170,574

PROCESS FOR PRODUCING OXIDIZING METAL CATALYSTS INCORPORATING PLATINUM AND CATALYST PRODUCED BY THE PROCESS

Hideya Inaba; Yasumi Kamino; Shigenori Onizuka, and Chikashi Inazumi, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japana

Filed Jan. 30, 1978, Ser. No. 873,692
Claims priority, application Japan, Sep. 12, 1977, 52-110095
Int. Cl.[2] B01J *21/04, 23/42, 23/74*
U.S. Cl. 252—472 10 Claims

1. A process for producing a catalyst precursor for decomposing NH_3 by oxidation consisting essentially of the steps of converting the surface layer of steel material of specified shape resembling a ring, honeycomb or plate to an aluminum alloy, treating the steel material with an aluminum dissolving solution to dissolve out the aluminum and to render the surface layer porous, subjecting the resulting steel material to oxidation treatment to obtain a catalyst carrier, immersing the carrier in a solution of chloroplatinic acid adjusted to weak alkalinity with sodium hydroxide and drying the carrier after withdrawing the carrier from the solution.

4,170,575

COMPOUND FOR PATCHING VOIDS IN A SEMI-CONDUCTIVE COMPONENT OF INSULATED ELECTRIC CABLE

Sidney Rothenberg, Fairfield, and Joseph E. Vostovich, Bridgeport, both of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 470,399, May 16, 1974, Pat. No. 4,061,703.
This application Aug. 24, 1977, Ser. No. 827,440
Int. Cl.[2] H01B *1/06*
U.S. Cl. 252—511 8 Claims

1. A curable semiconductive polymeric compound for patching voids in a body of a semiconductive component of an insulated electrical cable, consisting essentially of the combination of polymeric material, conductive filler material and lauroyl peroxide in amount of about 2 to about 8 parts by weight of the polymeric material, said polymeric material being composed of at least about 65% by weight of chlorosulfonated polyethylene and 0 to about 35% by weight of ethylene-propylene rubber.

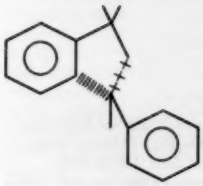
4,170,576

USES OF MIXTURES OF ALPHA METHYL STYRENE DIMERS AND TERPENE DIMERS IN PERFUMERY PROCESSES AND PRODUCTS

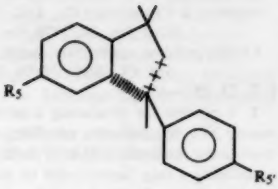
John B. Hall, Rumson; Wilhelmus J. Wiegers, Red Bank; Ira D. Hill, Locust; Robert M. Novak, Fords, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jul. 10, 1978, Ser. No. 923,183
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 23 Claims

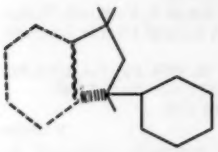
1. A mixture of (A) a dimerization product of an α-methyl styrene or a methyl or other C_2–C_4 lower alkyl homologue thereof or mixture of same having one of the generic structures:



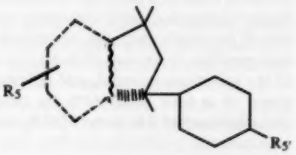
and



or hydrogenated derivatives thereof or mixtures of the foregoing wherein one R_5 and R_5' is C_1–C_4 alkyl and the other of R_5 and R_5' is hydrogen or R_5 and R_5' are both C_1–C_4 alkyl; wherein the line |||| represents a carbon-carbon single bond or no bond and wherein the line, ++++++. represents a carbon-carbon single bond or a carbon-carbon double bond, with the proviso that when the line +++++ is a carbon-carbon double bond then the line |||| is no bond and when the line +++++ is a carbon-carbon single bond then the line |||| is a carbon-carbon single bond, said hydrogenated alpha methyl styrene dimerization product having at least one structure defined according to at least one of the generic structures selected from the group consisting of:



and



wherein one of R_5 and R_5' is C_1–C_4 alkyl and the other is hydrogen or each of R_5 and R_5' is C_1–C_4 alkyl; wherein the dashed lines and the wavy line represent carbon-carbon single bonds or carbon-carbon double bonds with the proviso that when there is one double bond present in the ring having a wavy line and dashed lines, only the wavy line is a double bond and when there is more than one double bond present in the ring containing the dashed lines and the wavy line, the ring containing the dashed lines and the wavy line is a benzene ring; and wherein the line |||| represents either a carbon-carbon single bond or no bond and (B) a reaction product selected from the group consisting of (I) one or more twenty carbon atom containing dimerization products of (i) one monocyclic terpene containing two carbon-carbon double bonds or (ii) two different monocyclic terpenes containing two carbon-carbon double bonds or (iii) one bicyclic terpene containing one carbon-carbon double bond or (iv) two different bicyclic terpenes, each containing one carbon-carbon double bond or (v) one monocyclic terpene containing two carbon-carbon double bonds and one bicyclic terpene containing one carbon-carbon double bond; (II) hydrogenation products of one or more twenty carbon atom containing dimerization products of twenty carbon atom-containing terpenes and one or more hydrogenation products of one or more twenty carbon atom containing dimerization products of terpenes.

4,170,577

2,3-DIMETHYL-5-(2,2,3-TRIMETHYL-3-CYCLOPENTEN-1-YL)-2-PENTANOL PERFUME COMPOSITIONS

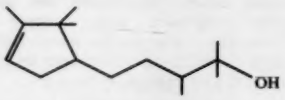
Venkatesh Kamath, Red Bank; Braja D. Mookherjee, and Frederick L. Schmitt, both of Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 893,542, Apr. 5, 1978. This application Dec. 8, 1978, Ser. No. 968,040

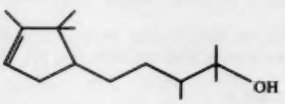
Int. Cl.[2] C11B *9/00*

U.S. Cl. 252—522 **2 Claims**

1. A perfume composition comprising a perfuming agent of a compound having the structure:



and an adjuvant therefor selected from the group consisting of aldehydes, alcohols other than the compound having the structure:



ketones, lactones, nitriles, carboxylic acid esters, ethers and natural essential oils.

4,170,578

AQUEOUS RAPID-DRYING PRINTING INK

Ealbertus W. Schelhaas, Heiloo, Netherlands, assignor to O+R Inktchemie N.V., Zaandam, Netherlands

Filed Mar. 28, 1977, Ser. No. 781,779

Claims priority, application Greece, Apr. 16, 1976, 50571; Netherlands, Oct. 21, 1976, 7611671

Int. Cl.[2] C09D *11/02, 11/08, 11/10, 11/14*

U.S. Cl. 260—17.2 **13 Claims**

1. A printing ink which rapidly dries under the influence of heat, in particular from infra-red radiation, characterized in that in addition to a hydrophobic phase which is composed of a non-polar solvent, a binder formed from a phenol- or cresol formaldehyde resin modified with colophony or with colophony and a polyhydric alcohol, a crosslinkable unsaturated polyester, the weight ratio of the solvent, the resin and polyester is such that the two latter components are present in dissolved state, but the resin is no longer soluble after the polyester has been crosslinked, and as a result has disappeared from the solution, a peroxide catalyst for said polyester present in the amount of 1–6 wt.% of said binder, and an effective pigment, the ink comprising an aqueous phase constituting 12–40 wt.% of the total ink, the aqueous phase having a relative low viscosity and being emulsified in the hydrophobic phase, and a thickener being incorporated in the amount of 0.5–20 wt.% of the aqueous phase, the nature and amount of the thickener being so selected that the viscosity of the aqueous phase is substantially equal to the viscosity of the hydrophobic phase.

4,170,579

COATING COMPOSITIONS COMPRISING AQUEOUS DISPERSIONS OF QUATERNARY AMMONIUM BASE GROUP-CONTAINING POLYMERS AND A CURING AGENT

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 744,534, Nov. 24, 1976, Pat. No. 4,071,428. This application Jan. 30, 1978, Ser. No. 873,586

The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.

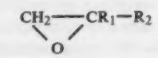
Int. Cl.[2] **C08J** *3/06, 3/08;* **C08L** *63/00, 63/10*

U.S. Cl. 260—29.2 TN **8 Claims**

1. An aqueous thermosetting resinous dispersion suitable for use in coating applications comprising a non-gelled active hydrogen-containing quaternary ammonium base group-containing polymer formed from reacting:

(A) a polymeric tertiary amine which is the reaction product of a polyepoxide having a molecular weight of at least 350 and a secondary amine,

(B) a 1,2-epoxy-containing material having the structural formula:



wherein R_1 is selected from the class consisting of hydrogen and methyl and R_2 is selected from the class consisting of hydrogen, alkyl including cycloalkyl, aryl, and substituted alkyl and aryl;

said reaction being conducted in the presence of sufficient acid and/or water for the formation of quaternary ammonium base groups;

said quaternary ammonium base group-containing polymer being in combination with a curing agent which is stable in the presence of the quaternary ammonium base group-containing polymer at room temperature but reactive through the active hydrogens of the quaternary ammonium base group-containing polymer at elevated temperature to form a crosslinked product.

4,170,580

COATING COMPOSITION

Joerg Doerffel, and Karl-Heinz Haneklaus, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 31, 1977, Ser. No. 830,275

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639967

Int. Cl.[2] **C08L** *61/32, 61/28, 61/24*

U.S. Cl. 260—29.4 R **7 Claims**

1. In a coating composition which comprises a binder consisting of a mixture of 50–90 percent of weight of a polyester with 50–10 percent of weight of an aminoplast, a low-molecular weight precursor of said aminoplast or a mixture thereof; said polyester having a number average molecular weight of 800–3,000 and an acid number of about 40–80 mg. KOH/g, as well as a hydroxyl number of at least the same order of magnitude;

water;

1–25 percent by weight of the total composition of an auxiliary organic solvent; and

optional conventional adjuvants;

the improvement wherein said auxiliary solvent consists essentially of 10–100% by weight of the total amount of auxiliary solvent of 1,4-bis(hydroxymethyl)-cyclohexane.

4,170,581

METHOD AND COMPOSITION RELATING TO EMULSION-POLYMERIZED POLYDIMETHYLSILOXANES IN DURABLE PRESS RESINS

Howard E. Griffin, Greensboro, N.C., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 4, 1978, Ser. No. 930,959

Int. Cl.[2] **C08L** *61/24, 83/04*

U.S. Cl. 260—29.4 R **8 Claims**

1. A method for preparing a homogeneous aqueous composition comprising a polydimethylsiloxane and a durable press resin, said method comprising

(A) preparing an emulsion consisting essentially of

(i) a polydimethylsiloxane having a viscosity of less than 100 mPa-s at 25° C. and being selected from the group consisting of cyclopolydimethylsiloxanes and linear, hydroxy-endblocked polydimethylsiloxanes,

(ii) a surface-active siloxane-polymerization catalyst selected from aliphatic hydrogen sulfates and hydrocarbonsulfonic acids, and

(iii) an aqueous solution of a durable press resin selected from dimethylolethylene urea and dimethyloldihydroxyethylene urea,

(B) allowing the emulsified polydimethylsiloxane to polymerize until a desired increase in molecular aggregation has been obtained, and thereafter p0 (C) neutralizing the surface-active catayst.

4,170,582

PROCESS FOR PREPARING A POLYMER RESIN AQUEOUS DISPERSION

Kaoru Mori, Izumi; Hiro Tanaka, Sakai; Hirosi Ozawa, Izumi-ohtsu, and Yoichi Murakami, Sennan, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Jul. 28, 1977, Ser. No. 819,933

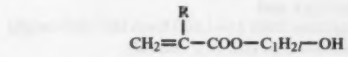
Claims priority, application Japan, Aug. 3, 1976, 51/92051

Int. Cl.[2] **C08L** *33/06*

U.S. Cl. 260—29.6 RW **12 Claims**

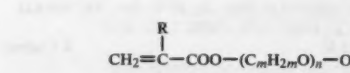
1. A process for producing a resin dispersion comprising polymerizing an ethylenically unsaturated monomer capable of forming a polymer insoluble in an aqueous medium in a solution formed by dissolving in an aqueous medium a water-soluble polymer derived from, based on the total monomers (1), (2) and (3),

(1) 10–90% by weight of a hydroxyalkyl acrylate or methacrylate expressed by the following general formula



wherein R is a hydrogen atom or a methyl group, and l is an integer of 2, 3 or 4,

(2) 10–90% by weight of a polyalkyleneglycol monoacrylate or monomethacrylate expressed by the following general formula



wherein R is a hydrogen atom or a methyl group, m is an integer of 2 or 3, and n is an integer of 2 to 20, and

(3) 0–30% by weight of another ethylenically unsaturated monomer.

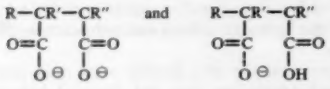
4,170,583
PHASE-REVERSIBLE COMPOSITION

Hiroyuki Itoh; Teruaki Yamanashi, and Hirosuke Imai, all of Yokohama, Japan, assignors to Nippon Oil Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 788,919, Apr. 19, 1977, abandoned. This application Nov. 16, 1977, Ser. No. 851,959
Claims priority, application Japan, Sep. 6, 1977, 51-47037
The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.
Int. Cl.[2] C08L 9/00, 9/10
U.S. Cl. 260—29.7 H 5 Claims

1. A phase-reversible composition comprising:

(A) a high-molecular anion resulting from the dissociation of at least a part o the carboxylic group of a conjugated diene-maleic acid derivative copolymer, having repeating units of the formulae



(I) (II)

wherein R represents a conjugated diene unit in the copolymer; R′ and R″ each represent hydrogen, a halogen atom or an organic radical having from 1 to 18 carbon atoms, the degree of dissociation in terms of the ratio of I:II being in the range of between 100:0 and 0:100 and having terminal groups of the formula

$$R'''—Y— \quad \text{(III)}$$

wherein R‴ represents an organic radical having from 4 to 30 carbon atoms; and Y represents S or SO_2, said terminal group being in amount of between 0.5 and 30 weight percent of the copolymer;

(B) one or more group consisting of Na^+, K^+, Li^+ and ammonium cations of the formula

$$R_1R_2R_3R_4N^+ \quad \text{(IV)}$$

wherein R_1, R_2, R_3, and R_4 are the same or different, each selected from the group consisting of hydrogen, alkyl radical cycloalkyl radical, aryl radical and aralkyl radical having from 1 to 18 carbon atoms, said cations being from 0.5 to 5.0 equivalents based on the maleic acid derivative unit in the Component (A);

(C) Mg^{2+} of from 0.5 to 2.0 equivalents based on the maleic acid derivative unit in the Component (A);

(D) one or more anions which form a water-soluble magnesium compound with Mg^{++}, said anion being from 0.5 to 7.0 equivalents based on the maleic acid derivative unit in the Component (A); and

(E) water in an amount from 1 to 1,000 times the total weight of the Components (A), (B), (C), and (D).

4,170,584
SMOKE-SUPPRESSANT COMPOSITION

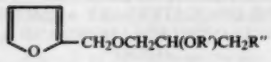
John S. Heckles, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation-in-part of Ser. No. 766,953, Feb. 9, 1977, abandoned. This application May 26, 1978, Ser. No. 909,621
Int. Cl.[2] C08J 3/18; C08K 5/05, 5/15
U.S. Cl. 260—30.4 R 4 Claims

1. A smoke-retardant composition comprising

(a) a poly(vinyl chloride) homopolymer or copolymer with up to about 50% by weight of at least one other olefinically unsaturated monomer, and

(b) a smoke-suppressant amount of a heterocyclic compound of the formula



where R′ is hydrogen or C_1 to C_8 linear or branched alkyl carboxylate, and R″ is hydrogen, C_1 to C_8 linear or branched alkoxy, C_1 to C_8 alkoxy substituted linear or branched C_1 to C_8 alkoxy or furfuryloxy.

4,170,585
ADHESIVE COMPOSITION

Akira Motegi, and Kaoru Kimura, both of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1978, Ser. No. 931,584
Claims priority, application Japan, Aug. 5, 1977, 52/93407
Int. Cl.[2] C08K 5/06
U.S. Cl. 260—33.2 R 10 Claims

1. An adhesive composition comprising an α-cyanoacrylate and about 0.0001% by weight to about 20% by weight, based on the weight of the adhesive composition, of at least one compound selected from the group consisting of

(1) polyethylene glycols having a degree of polymerization of at least 3, and

(2) non-ionic surface active agents having a poly(ethyleneoxy) moiety therein with the poly(ethyleneoxy) moiety having a degree of polymerization of at least 3.

4,170,586
PLASTICIZED BUTENE-1 POLYMER COMPOSITIONS

Bert H. Clampitt, Katy, and Donald E. Horstman, Houston, both of Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Sep. 11, 1978, Ser. No. 941,839
Int. Cl.[2] C08K 5/01
U.S. Cl. 260—33.6 PQ 5 Claims

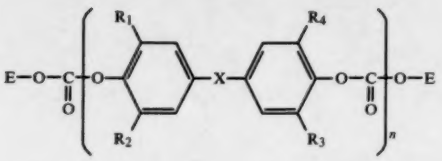
1. A plasticized butene-1 polymer composition consisting essentially of a crystalline butene-1 polymer having a hydrocarbon plasticizer uniformly distributed therein; said hydrocarbon plasticizer being a hydrogenated, highly-branched, dimer of an alpha olefin containing about 8–12 carbon atoms, and having a viscosity in the range of about 40 to 6.5 centistokes at 100° F. (38° C.).

4,170,587
STATISTICAL MIXTURES OF HALOGENATED BISPHENOLS WITH HALOGEN-FREE BISPHENOLS, A PROCESS FOR THEIR PREPARATION AND THEIR USE FOR THE PREPARATION OF HIGH-MOLECULAR WEIGHT THERMOPLASTIC POLYCARBONATES

Manfred Schmidt; Dieter Freitag, and Werner Nouvertné, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 678,807, Apr. 21, 1976, Pat. No. 4,075,119. This application Nov. 7, 1977, Ser. No. 849,278
Claims priority, application Fed. Rep. of Germany, May 7, 1975, 2520316; May 7, 1975, 2520317; Dec. 17, 1975, 2556739
Int. Cl.[2] C08L 69/00; C08K 7/14
U.S. Cl. 260—37 PC 18 Claims

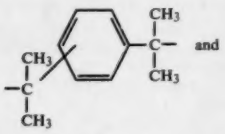
1. A composition comprising high-molecular weight, thermoplastic, aromatic polycarbonates containing halogen selected from the group consisting of bromine and chlorine having recurrent but not identical structural units of the following formula III



III

wherein

X denotes C_1–C_9 alkylene, C_2–C_9 alkylidene, C_5–C_{15} cycloalkylene, C_5–C_{15} cycloalkylidene, a single bond, —O—, —S—, —SO—, —SO_2—, —CO— or



and

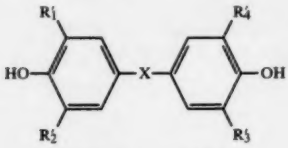
R_1 to R_4 are identical or different and denote H, Br or Cl,

n is an integer between 20 and 800 and

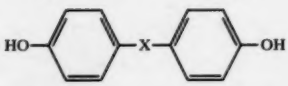
E are phenyl, C_1–C_6-alkyl-substituted phenyl,

bromine-substituted phenyl or chlorine-substituted phenyl,

the total halogen content resulting from the individual radicals R_1 to R_4 and E being between about 2% by weight and 45% by weight, the bromine content being between about 0 and 45% by weight and the chlorine content being between about 0 and 27% by weight wherein said polycarbonates are prepared from statistical mixtures comprising halogen-free bisphenols of the formula II with mono-, di-, tri- and tetrahalogenated bisphenols, wherein the halogen is selected from the group consisting of bromine and chlorine, of the formula I



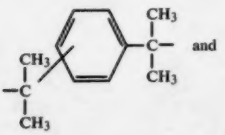
I



II

wherein

X denotes C_1–C_9 alkylene, C_2–C_9 alkylidene, C_5–C_{15} cycloalkylene, C_5–C_{15} cycloalkylidene, a single bond, —O—, —S—, —SO—, —SO_2—, —CO— or



and

R_1' to R_4' are identical or different and denote H, Br or Cl, and at least one R' is Br or Cl,

wherein the total halogen content of the mixtures is about 3 to 48% by weight and they contain about 0–48% by weight of bromine alone, about 0–30% by weight of chlorine alone or bromine and chlorine conjointly in any desired ratios by weight.

4,170,588

SYNTHETIC RESIN STABILIZERS BASED ON QUADRATIC ACID AMIDES

Peter Hegenberg, deceased, late of Marl, Fed. Rep. of Germany (by Anna F. Hegenberg); Johanna M. Hegenberg, heir; Dagmar Hegenberg, heir, both of Munich, Fed. Rep. of Germany; Joachim Hegenberg, heir, Neukaferloh bei Munich, Fed. Rep. of Germany; Felicitas Zottl, heir, Munich, Fed. Rep. of Germany; Sigrid Rossnagel, heir, Wendelstein bei Nurnberg, Fed. Rep. of Germany; Heidelore Freyberger, heir, Munich, Fed. Rep. of Germany; Hans-Ernst Sprenger, Wanne-Eickel, Fed. Rep. of Germany; Helmut Birkner, Marl, Fed. Rep. of Germany; Armin Gude, Marl, Fed. Rep. of Germany; Gerhard Menzel, Marl, Fed. Rep. of Germany, and Konrad Rombusch, Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

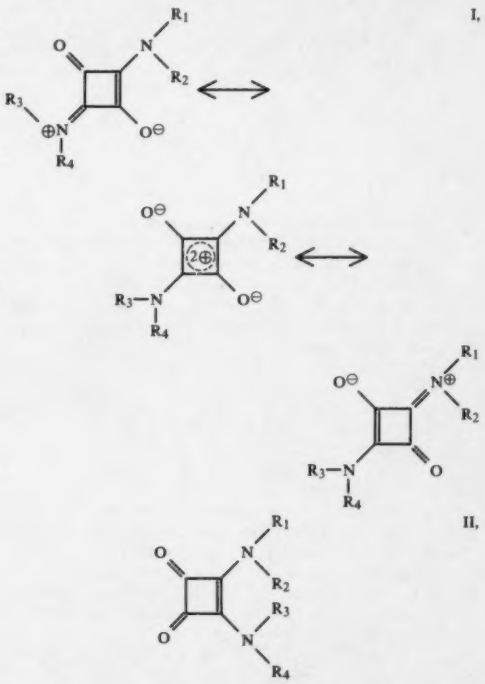
Filed Aug. 29, 1977, Ser. No. 828,597

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1976, 2638855; May 21, 1977, 2723020

Int. Cl.[2] **C08K** *5/34, 5/35, 5/29*

U.S. Cl. 260—45.8 N **6 Claims**

1. Compositions comprising synthetic resins having about 0.01–5% by weight of stabilizers based on the total weight of said synthetic resins wherein said synthetic resins are selected from the group consisting of polymers of olefins, diolefins, vinyl acetate, ether esters, urethanes, isocyanurates, acrylonitrile, styrene, vinyl chloride, polyamides, polyether amides, polyester amides, polyether ester amides or mixtures thereof; and said stabilizers are selected from the group consisting of bisamides of quadratic acid of the general Formulas I, II, or mixtures of I and II:



I,

II,

wherein R_1, R_2, R_3, and R_4 represent:

(A) hydrogen, alkyl groups having 1–22 carbon atoms, alkylene groups having 1–22 carbon atoms, hydroxysubstituted alkyl groups having 1–22 carbon atoms or hydroxysubstituted alkylene groups having 1–22 carbon atoms;

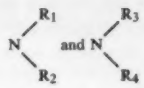
(B) cycloalkyl groups having 6–12 carbon atoms, cycloalkyl

groups having 6–12 carbon atoms and substituted with alkyl groups having 1–6 carbon atoms, cycloalkyl groups having 6–12 carbon atoms and bound to the nitrogen atoms of Formula I by alkylene groups having 1–5 carbon atoms or cycloalkyl groups having 6–12 carbon atoms and bound to the nitrogen atoms of Formula II by alkylene groups having 1–5 carbon atoms;

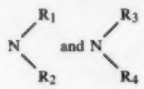
(C) phenyl groups, phenyl groups substituted with alkyl groups having 1–4 carbon atoms, phenyl groups substituted with hydroxy groups, phenyl groups substituted with hydroxy groups and alkyl groups having 1–4 carbon atoms, phenyl groups bound to the nitrogen atoms of Formula I by alkylene groups having 1–3 carbon atoms or phenyl groups bound to the nitrogen atoms of Formula II by alkylene groups having 1–3 carbon atoms;

(D) 3–6 member heterocyclic groups having 1–3 nitrogen atoms, 3–6 member heterocyclic groups having 1–3 oxygen atoms, 3–6 member heterocyclic groups having 1–3 oxygen atoms, 3–6 member heterocyclic groups having 1–3 oxygen and nitrogen atoms, said heterocyclic groups substituted with alkyl groups having 1–3 carbon atoms, said heterocyclic groups bound to the nitrogen atoms of Formula I by alkylene groups having 1–5 carbon atoms or said heterocyclic groups bound to the nitrogen atoms of Formula II by alkylene groups having 1–5 carbon atoms;

(E) said



groups defining heterocyclic groups having 3–6 members, said



groups defining heterocyclic groups having 3–6 members where 1 or 2 of said members are nitrogen or oxygen, said heterocyclic groups substituted with 1–4 carbon alkyl groups, hydroxy groups or oxogroups; and

(F) respectively R_1 and R_3 or R_2 and R_4 represent unbranched or branched, ring-anellated, saturated or unsaturated aliphatic chains.

4,170,589

CATALYTIC POLYMERIZATION OF ETHYLENE WITH SUPPORTED CHROMIUM [II] CATALYST IN THE PRESENCE OF A PHENOLIC ANTIOXIDANT

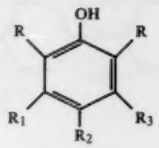
George L. Goeke, Kendall Park; Anthony D. Hamer, and Frederick J. Karol, both of Belle Mead, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 22, 1978, Ser. No. 880,079

Int. Cl.[2] **C08K** *5/13, 4/78;* **C08F** *10/02*

U.S. Cl. 260—45.95 H **11 Claims**

1. In a process for polymerizing a monomer charge comprising at least a major amount of ethylene by contacting said charge with a catalyst comprising chromium [II] compound supported on activated inorganic oxide, the improvement which comprises employing said catalyst in the presence of a phenolic antioxidant of the formula:

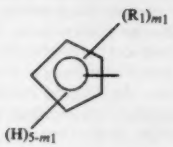


wherein each R is independently C_4 to C_{12} branched hydrocarbon radicals with steric factors, Es, less than -1.5; R_1, R_2 and R_3 are independently hydrogen, saturated or unsaturated aliphatic hydrocarbon radicals or aryl radicals which are unsubstituted with polar groups or substituted with polar groups, wherein the aryl radicals containing the polar groups contain R groups in adjacent position thereto, and said chromium [II] compound is of the formula:

Ar—Cr[II]-Ar'

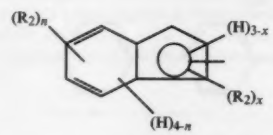
wherein Ar and Ar' are the same or different and are radicals of the structure:

(a) cyclopentadienyl radicals of the structure



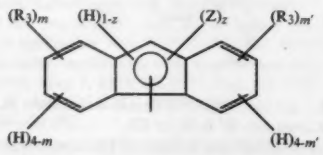
where each (R_1) is independently C_1 to C_{20} hydrocarbon radicals, and each m_1 is an integer of 0 to 5;

(b) indenyl radicals of the structure:



wherein the (R)s are the same or different C_1 to C_{10}, hydrocarbon radicals, and n is an integer of 0 to 4 and x is an integer of 0 to 3, and

(c) fluorenyl radicals of the structure:



wherein the (R)'s may be the same or different C_1 to C_{10} hydrocarbon radicals, m and m' may be the same or different integers of 0 to 4 inclusive, and (Z) is H or (R_3) and z is 0 or 1.

4,170,590
ION EXCHANGER TREATMENT OF CITRATE-STABILIZED PLASMA

Wolfgang Stephan, Dreieichenhain, and Ronald Kotitschke, Dreieich, both of Fed. Rep. of Germany, assignors to Biotest-Serum-Institut GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 639,960, Dec. 11, 1975, Pat. No. 4,081,431. This application Feb. 6, 1978, Ser. No. 875,489

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1974, 2459291

Int. Cl.[2] **A23J** *1/06*

U.S. Cl. 260—112 B **7 Claims**

1. In the fractionation of blood comprising the steps of taking blood from a donor, separating the solids from the plasma, freezing the plasma, thawing the frozen plasma and separating from the thawed plasma fluid a first product comprising undissolved cryoprecipitate enriched in factor-VIII protein; dissolving the first product, removing impurities from the solution of the first product, precipitating the factor-VIII protein from the solution; after separation of the first product treating the residual thawed plasma fluid with a solid adsorbent thereby to adsorb the factors II, VII, IX and X, and separating a second product comprising solid adsorbent and the adsorbed factors from the residual plasma; and, after separation of the second product, contacting the residual plasma with colloidal silica and separating a third product comprising a storage-stable serum protein solution from the colloidal silica, the improvement which comprises mixing the blood or plasma with a citrate stabilizer prior to freezing and treating the residual thawed plasma fluid with an anion exchange resin and a cation exchange resin prior to treatment with the solid adsorbent.

4,170,591
AZIRIDINE COMPLEXES ISOMERIZE TO FORM CHELATED DIMERS

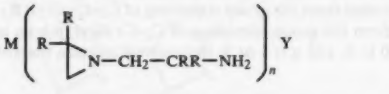
John M. Motes, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 128,128, Mar. 25, 1971, abandoned, which is a continuation-in-part of Ser. No. 731,613, May 23, 1968, abandoned. This application May 9, 1973, Ser. No. 358,564

Int. Cl.[2] **C07D** *203/12;* **A01N** *9/22*

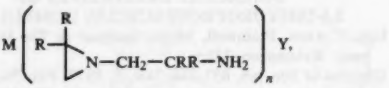
U.S. Cl. 260—239 E **16 Claims**

1. A substantially pure and crystalline compound of the formula:

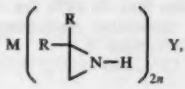


wherein M is an n-valent ion of Co, Ni, Cu or Zn; Y is n equivalents of an anion selected from the group consisting of fluoride, chloride, bromide, iodide, sulfate, nitrate perchlorate and acetate; each R independently is hydrogen or an alkyl radical of from 1 to 4 carbon atoms and n is 2 or 3, being the valence of M.

2. A process for preparing an aziridine-dimer chelate of the formula



wherein M is an n-valent ion of Cr, Mn, Fe, Co, Ni, Cu or Zn; Y is n-equivalents of an inert anion; each R independently is hydrogen or an alkyl radical of from 1 to 4 carbon atoms; and n is 2 or 3, being the valence of M, said process comprising maintaining a solution of an aziridine-metal salt dissolved in a polar solvent at a temperature of from about 20° to about 70° C. for a time sufficient to convert the aziridine-metal salt to the aziridine-dimer chelate; said aziridine-metal salt corresponding to the formula



wherein M, R, Y and n have the aforesaid meaning.

4,170,592
PURIFICATION OF ϵ-CAPROLACTAM

Harry Danziger; Bernd-Ulrich Kaiser, both of Krefeld, Fed. Rep. of Germany; Guido Rampart, Ekeren, Belgium, and Jürgen Schröter, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 9, 1977, Ser. No. 832,007

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641449

Int. Cl.[2] **C07D** *201/16*

U.S. Cl. 260—239.3 A **1 Claim**

1. A process for purifying a solvent solution of ϵ-caprolactam dissolved in benzene, toluene or xylene and containing an impurity selected from the group consisting of salts, acids and alkalies, said process comprising counter-current extracting the solvent solution in at least three stages with 5% to 50% by weight, based on the weight of the solvent solution, of a washing liquid comprising a solution of ϵ-caprolactam in water having an ϵ-caprolactam to water weight ratio of from 15:1 to 1:3 to thereby obtain a solvent solution of ϵ-caprolactam of reduced impurity content and an aqueous solution of ϵ-caprolactam containing impurities removed from said solvent solution.

4,170,593
1-(SUBSTITUTED AMINO)ALKANOYL-2-(DIBENZOXAPINE-10-CARBONYL)HYDRAZINES AND DERIVATIVES THEREOF

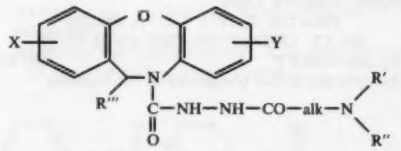
Richard A. Mueller, Northbrook, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Division of Ser. No. 812,552, Jul. 5, 1977, Pat. No. 4,125,532, which is a division of Ser. No. 646,686, Jan. 5, 1976, Pat. No. 4,045,442. This application Aug. 25, 1978, Ser. No. 936,963

Int. Cl.[2] **C07D** *413/12*

U.S. Cl. 260—243.3 **6 Claims**

1. A compound of the formula



wherein X and Y represent hydrogen, halogen, lower alkyl having 1–7 carbon atoms, trifluoromethyl; alk represents lower alkylene having 1–6 carbon atoms; and R′ and R″ together with N represents an azamonocyclic ring wherein the azamonocyclic ring is morpholino, 4-methylpiperazinyl or piperazinyl, and R‴ represents hydrogen or lower alkyl having 1–4 carbon atoms.

4,170,594

OXAZOLYL-ALKYL-DISULPHIDES AS FLAVORANTS

Paul Dubs, Zug, and Heiner Klintzel, Dübendorf, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 726,100, Sep. 24, 1976, Pat. No. 4,130,562. This application May 15, 1978, Ser. No. 906,295

Claims priority, application Switzerland, Oct. 1, 1975, 12728/75; Jul. 20, 1976, 9280/76

Int. Cl.[2] C07D *263/32, 263/46*

U.S. Cl. 548—229 **6 Claims**

1. A disulfide having the formula:

$$R_1—(Y)_n—S—S—R_2,$$

wherein R_1 is an optionally C_{1-6}-alkyl substituted 2-oxazolyl group, Y is an optionally mono- or di-C_{1-6}-alkyl substituted methylene group, n is an integer from 0 to 5, and R_2 is a C_{1-6}-lower alkyl group.

4,170,595

3-ETHYL-1,3-DIHYDRO-3-METHOXY-2H-INDOLE 2-ONE

John Westley, Clifton, and Chao-Min Liu, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 712,286, Aug. 6, 1976, Pat. No. 4,100,171. This application Apr. 20, 1978, Ser. No. 898,053

Int. Cl.[2] C07D *209/38, 407/08*

U.S. Cl. 260—325 R **1 Claim**

1. A compound of the formula: 3-ethyl-1,3-dihydro-3-methoxy-2H-indole-2-one.

4,170,596

NOVEL MONOESTERS OF CIS-CYCLOPENTENEDIOL, PROCESS FOR PREPARATION THEREOF, AND PROCESS FOR PREPARATION OF LACTONES FROM THE MONOESTERS

Shun-Ichi Yamada, 2-11-3, Nishitsutsujigaoka, Chofu-shi, Tokyo; Shiro Terashima, 2-27-4, Kyodo, Setagawa-ku, Tokyo; Masahiko Nagakura, 5-10-503, Sayamadai, Sayama-shi, Saitama-ken, and Munehiko Nara, 3-9-8, Miyasaka, Setagaya-ku, Tokyo, all of Japan, assignors to Kowa Company, Ltd., Aichi

Filed Oct. 4, 1977, Ser. No. 839,356

Claims priority, application Japan, Oct. 5, 1976, 51/119745; Oct. 5, 1976, 51/119746; Oct. 5, 1976, 51/119747

Int. Cl.[2] C07D *207/12;* **C07C** *149/40*

U.S. Cl. 260—326.47 **2 Claims**

1. (1)(R)4(S)- or 1(S)4(R)-4-hydroxy-2-cyclopentenyl N-tosyl-L-prolinate.

2. 1(R)4(S)- or 1(S)4(R)-4-hydroxy-2-cyclopentenyl N-mesyl-L-phenylalaninate.

4,170,597

1-HYDROXYMETHYL-1-OXO-PROSTANE DERIVATIVES OF THE E_2 SERIES

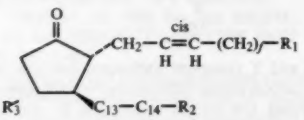
Allan Wissner, Ardsley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 8, 1977, Ser. No. 858,588

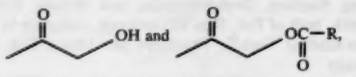
Int. Cl.[2] C07D *317/10;* **C07C** *49/28, 69/02*

U.S. Cl. 260—340.9 P **187 Claims**

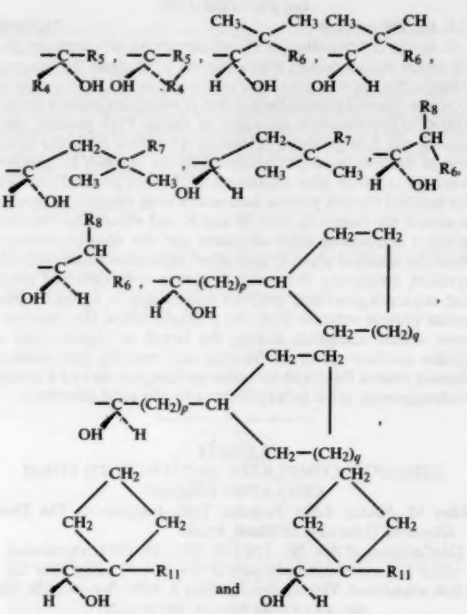
1. An optically active compound of the formula:



wherein f is an integer from 2 to 4, inclusive; R_3 is selected from the group consisting of hydrogen and hydroxyl; C_{13}–C_{14} is selected from the group consisting of ethylene and trans-vinylene; R_1 is a radical selected from the group consisting of



wherein R is selected from the group consisting of C_1–C_4 alkyl; R_2 is a moiety selected from the group consisting of



wherein R_4 is selected from the group consisting of hydrogen and methyl, R_5 is selected from the group consisting of C_4–C_7 alkyl, R_6 is selected from the group consisting of C_3–C_5 alkyl, R_7 is selected from the group consisting of C_2–C_4, R_8 is selected from the group consisting of C_1–C_2 alkyl, R_{11} is selected from the group consisting of C_3–C_7 alkyl, p is an integer from 0 to 3, and q is 1 or 2; the racemic mixture thereof.

4,170,598

5-MERCURY DERIVATIVES OF 5,6-DIHYDROPROSTACYCLIN COMPOUNDS

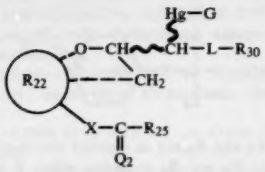
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 857,236, Dec. 5, 1977, Pat. No. 4,125,712, which is a continuation-in-part of Ser. No. 788,146, Apr. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 691,400, Jun. 1, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 917,032

Int. Cl.[2] C07D *307/93*

U.S. Cl. 260—346.22 **10 Claims**

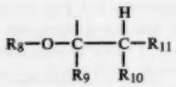
1. A mercury compound of the formula



wherein G is nitrato, iodo, chloro, bromo, acetato, trifluoracetato, or benzoato;

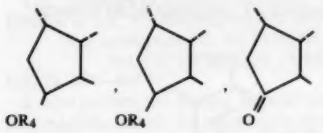
wherein L is (1) a valence bond, (2) $-(CH_2)_d-$ wherein d is one to 5 inclusive, (3) $-(CH_2)_t-CF_2$ wherein t is 2, 3, or 4, (4) $-CH_2-CH=CH-A-$ wherein A is a valence bond or $-(CH_2)_h-$ wherein h is one, 2, or 3, or (5) $-CH_2-O-CH_2-Y-$ wherein Y is a valence bond or $-(CH_2)_k-$ wherein k is one or 2; wherein Q_2 is

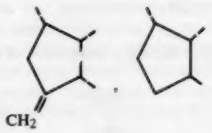
wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein R_4 is hydrogen, tetrahydropyranyl, tetrahydrofuranyl, 1-ethoxyethyl or a group of the formula

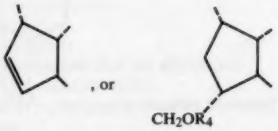


wherein R_8 is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_9 and R_{10} are taken together, $-(CH_2)_a-$ or $-(CH_2)_b-O-(CH_2)_c-$ wherein a is 3, 4, or 5, b is one, 2, or 3, and c is one, 2, or 3 with the proviso that b plus c is 2, 3, or 4, and wherein R_{11} is hydrogen or phenyl;

wherein R_{22} is



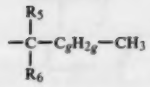




wherein R_4 is as defined above;

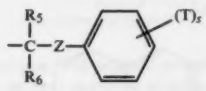
wherein R_{25} is

(1)



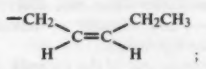
wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;

(2)



wherein R_5 and R_6 are as defined above with the proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 6 carbon atoms, inclusive between $-CR_5R_6-$ and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7$ wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; or

(3)

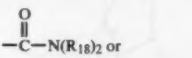


wherein R_{30} is

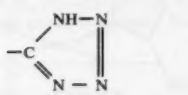
(1) -COOR$_{19}$

(2) -CH$_2$OH

(3) -CH$_2$N(R_{18})$_2$



(4)



(5)

wherein R_{19} is

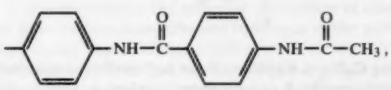
(a) alkyl of one to 12 carbon atoms, inclusive,

(b) cycloalkyl of 3 to 10 carbon atoms, inclusive,

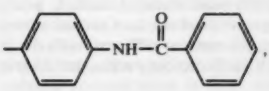
(c) aralkyl of 7 to 12 carbon atoms, inclusive,

(d) phenyl,

(e) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive;

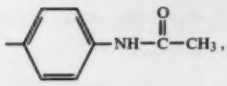


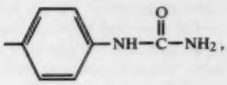
(f)

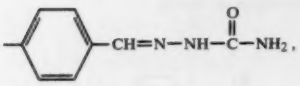


(g)

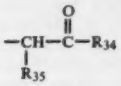
-continued

(h) 

(i) 

(j) 

(k)

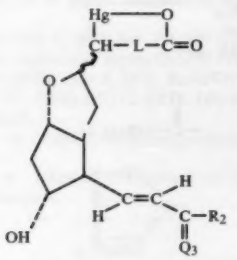
(l) 

wherein R_{34} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{35} is hydrogen or benzoyl,

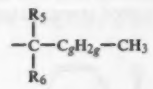
(m) hydrogen, or

(n) a pharmacologically acceptable cation; and wherein R_{18} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different; wherein X is trans—CH=CH—, cis—CH=CH—, —C≡C—, or $—CH_2CH_2—$; and wherein ~ indicates attachment in alpha or beta configuration.

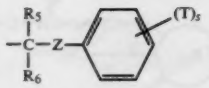
3. A mercury compound of the formula



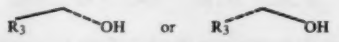
wherein L is $—(CH_2)_d—$ or $—CH_2O—CH_2—Y—$ wherein d is one to 5, inclusive, and Y is a valence bond or $—(CH_2)_k—$ where k is one or 2; wherein R_2 is

(1) 

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $—CR_5R_6—$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro; or

(2) 

wherein R_5 and R_6 are as defined above with the proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between $—CR_5R_6—$ and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_7$ wherein R_7 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; wherein Q_3 is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; and wherein ~indicates attachment in alpha or beta configuration.

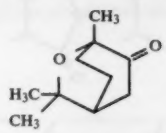
4,170,599

PROCESS FOR THE PREPARATION OF 1,3,3-TRIMETHYL-2-OXABICYCLO[2,2,2]OCTAN-6-ONES

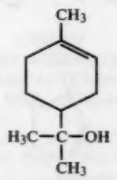
Gregory B. Bennett, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Jun. 19, 1978, Ser. No. 916,867
Int. Cl.[2] C07D *311/00*
U.S. Cl. 260—345.2 **8 Claims**

1. A process for preparing a compound of the formula



which comprises epoxidizing a compound of the formula



with a peracid under an inert atmosphere in the presence of an inert organic solvent to form an intermediate and thereafter oxidizing said intermediate with pyridinium chlorochromate or chromium trioxide in an inert organic solvent.

4,170,600

THIOCYANOMETHYL SUBSTITUTED ANTHRAQUINONE DISPERSE DYES

Werner Baumann, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed May 30, 1978, Ser. No. 910,826

Claims priority, application Switzerland, Jun. 2, 1977, 6787/77

Int. Cl.[2] C09B *1/50;* C07C *97/26;* C09B *1/515*

U.S. Cl. 260—380 11 Claims

1. An anthraquinone disperse dyestuff which contains at least one group of formula $-Y-CH_2(SCN)$ where Y is a mono- or binuclear aryl group.

4,170,601

METHOD FOR ISOLATING INSECT SEX PHEROMONES

Graham Leadbetter, 9340 Edmonston Rd., Greenbelt, Md. 20770

Filed May 9, 1977, Ser. No. 795,277

Int. Cl.[2] C09F *5/10;* C11B *3/00;* C07C *69/00, 97/16, 83/00*

U.S. Cl. 260—428.5 7 Claims

1. A method of separating a mixture of E and Z isomers of mono-olefins suitable for use as insect sex pheromones or the preparation thereof which comprises reacting said mixture of E and Z isomers with urea to form an inclusion complex with the E isomer and separating said E isomer complex from said Z isomer; said mono olefins being characterized by having a primary linear chain of at least 7 atoms consisting of carbon atoms, or carbon atoms and 1-2 non-adjacent, linear hetero atoms selected from the group consisting of N, O, S and P and having a molecular diameter of 2.8 to 6 A, at least one terminal functional group having dimensions transverse to said linear chain of 2.83 to 6 A, hydrogen or methyl groups only being present as branches on said primary linear chain of 7 atoms and between said terminal group and the olefinically bonded atoms, and a single hydrogen atom being present on only one of said olefinically bonded atoms with a single methyl group being present on the other.

4,170,602

METHOD OF PRODUCING ACICULAR METAL CRYSTAL

Robert J. Deffeyes, and Wesley R. Tyler, both of Arlington, Tex., assignors to Graham Magnetics, Inc., Graham, Tex.

Division of Ser. No. 401,636, Sep. 28, 1973, Pat. No. 3,909,240. This application Jul. 11, 1975, Ser. No. 595,067

Int. Cl.[2] C07F *15/02, 15/04, 15/06*

U.S. Cl. 260—439 R 42 Claims

1. In a process for making acicular organometallic salts of ferromagnetic metals the steps of reacting metal ions in solution with a carboxylic organic acid and precipitating an organometallic salt, the improvement comprising the steps of incorporating a metal-complexing agent in said solution to form at least one soluble metal-complex compound, and initiating growth of said organometallic salt crystals in the presence of said metal complex compound, said agent being incorporated in a quantity sufficient to enhance the acicular growth of said salt crystals.

4,170,603

NOVEL SUBSTITUTED METHYLENE BRIDGED ALUMINUM OLIGOMERS

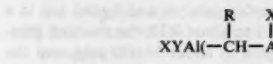
Loyd W. Fannin, Dickinson, Tex., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 3, 1977, Ser. No. 774,005

Int. Cl.[2] C07F *5/06*

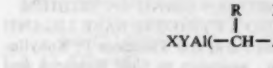
U.S. Cl. 260—448 A 19 Claims

1. A compound having the formula



in which X is a halogen, Y is an alkyl group having from 1 to 10 carbon atoms, a phenyl group or a halogen, R is an alkyl group having from 2 to 9 carbon atoms, and n is an integer from 1 to 20, provided that wneh X and Y are both halogen or when Y is methyl, R is a straight chain alkyl group having from 2 to 9 carbon atoms or a branched chain alkyl radical having from 4 to 9 carbon atoms in the primary chain.

11. A process for the production of a compound having the formula



in which X is a halogen, Y is an alkyl group having from 1 to 10 carbon atoms, an aryl group or a halogen, R is an alkyl group having from 2 to 9 carbon atoms, and n is an integer from 1 to 20, comprising reacting an aluminum compound selected from the group consisting of alkylaluminum dihalides, alkylaluminum sesquihalides, aluminum trihalides and precursors thereof with a terminal mono-olefin having from 3 to 10 carbon atoms in the presence of metallic aluminum.

4,170,604

PRODUCTION OF DIALKYLALUMINUM HYDRIDES

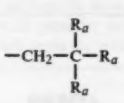
Dennis B. Malpass, LaPorte, Tex., and Spencer C. Watson, Wilmington, Del., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 871,316, Jan. 23, 1978, abandoned, which is a continuation of Ser. No. 661,913, Feb. 27, 1976, Pat. No. 4,101,568. This application Nov. 6, 1978, Ser. No. 958,236

Int. Cl.[2] C07F *5/06*

U.S. Cl. 260—448 A 2 Claims

1. A compound having the formula R_2AlH in which R is a tri-substituted alkyl group having the formula



in which the groups R_a are alkyl groups having from 1 to 5 carbon atoms, and the group R contains from 5 to 15 carbon atoms.

4,170,605

SYNTHESIS OF ETHYLENE GLYCOL FROM CARBON MONOXIDE AND HYDROGEN USING A RUTHENIUM COMPLEX CATALYST AND A PYRIDINE BASE LIGAND

Roger C. Williamson, Allison Park, and Thaddeus P. Kobylinski, Gibsonia, both of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Apr. 6, 1978, Ser. No. 894,172

Int. Cl.[2] C07C *27/06, 29/00*

U.S. Cl. 260—449 L 15 Claims

1. In a process for the selective production of ethylene glycol from carbon monoxide and hydrogen in the presence of a catalyst, the improvement which comprises contacting carbon monoxide and hydrogen with a catalyst consisting essentially of a catalytic amount of a ruthenium complex catalyst selected from the group consisting of ruthenium tris (acetylacetonate), ruthenium trihydroxide, and mixtures thereof; and a pyridine base ligand, wherein the carbon monoxide and hydrogen are in a molar ratio of from about 1:10 to about 10:1, the ruthenium complex catalyst concentration is from about 1×10^{-6} gm

moles/liter to about 1 gm mole/liter based on the reaction mixture, the ruthenium complex catalyst and ligand are in a molar ratio of from about 1:1 to about 1:10, the reaction pressure is from about 10,000 psig to about 50,000 psig, and the reaction temperature is in the range of about 100° to about 600° C.

4,170,606

SYNTHESIS OF ETHYLENE GLYCOL FROM CARBON MONOXIDE AND HYDROGEN USING AN IRIDIUM COMPLEX CATALYST AND A PYRIDINE BASE LIGAND

Roger C. Williamson, Allison Park, and Thaddeus P. Kobylinski, Gibsonia, both of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Apr. 6, 1978, Ser. No. 894,173
Int. Cl.[2] C07C *27/06, 29/00*
U.S. Cl. 260—449 L **15 Claims**

1. In a process for the selective production of ethylene glycol from carbon monoxide and hydrogen in the presence of a catalyst, the improvement which comprises contacting carbon monoxide and hydrogen with a catalyst consisting essentially of a catalytic amount of an iridium complex catalyst selected from the group consisting of iridium dicarbonyl acetyl acetonate, iridium tris(acetylacetonate) and mixtures thereof and a pyridine base ligand; wherein the carbon monoxide and hydrogen are in a molar ratio of from about 1:10 to about 10:1; the iridium complex catalyst concentration is from about 1×10^{-6} gm. moles/liter to about 1 gm. mole/liter based on the reaction mixture; the iridium complex catalyst and ligand are in a molar ratio of from about 1:1 to about 1:10; having a pressure of from about 10,000 psig. (68.30 MPa) to about 50,000 psig. (341.50 MPa), and a temperature of from about 180° C. to about 300° C., for a period of time sufficient to produce ethylene glycol.

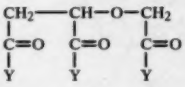
4,170,607

CARBOXYMETHYLOXYSUCCINIC ANHYDRIDES, HALIDES AND DERIVATIVES THEREOF

Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 797,226, May 16, 1977, Pat. No. 4,093,634. This application Apr. 4, 1978, Ser. No. 893,229
Int. Cl.[2] C07C *91/04*
U.S. Cl. 260—501.17 **1 Claim**

1. A mixture of amido ether polycarboxyl compounds of the general formula:



wherein Y is independently NH_2, —NRR', or OM_1, and at least one Y is always OM_1; wherein R is an alkyl group containing 6 to 22 carbon atoms or an alkyl group R_2OH wherein R_2 contains 2 to 4 carbon atoms; and wherein R' is H or R as defined above and wherein M_1 is monoethanolammonium, diethanolammonium, triethanolammonium, isopropanolammonium, diisopropanolammonium or triisopropanolammonium.

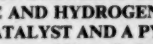
4,170,608

ADDITION OF N,N-DICHLORO-N-ACYL COMPOUNDS TO CONJUGATED DIENES AND SULFAMIDE PRODUCTS THEREFROM

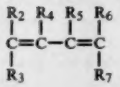
Francis A. Daniher, Ann Arbor, Mich., and Alexis A. Oswald, Mountainside, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 579,455, May 21, 1975, which is a continuation-in-part of Ser. No. 688,308, Dec. 6, 1967, Pat. No. 3,884,963. This application Mar. 30, 1978, Ser. No. 891,502
Int. Cl.[2] C07C *143/75*
U.S. Cl. 260—556 N **11 Claims**

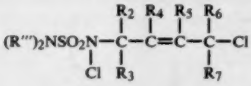
1. A selective addition-reduction process for the preparation of N-(4-chlorocrotyl-1) acyl compounds comprising adding an N,N-dichloro acyl compound of the formula



wherein R''' is a hydrocarbyl radical having from 1 to 30 carbon atoms and is selected from the group consisting of unsubstituted alkyl and substituted alkyl, phenyl, alkylphenyl and halophenyl to a conjugated diene of from 4 to 30 carbon atoms of the formula

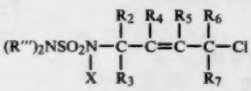


wherein R_2 to R_7 are selected from the group consisting of hydrogen, chlorine, fluorine, alkyl groups having from 1 to 30 carbon atoms and combinations thereof at a temperature of between about −80° and about 100° C. in the absence of added catalyst and at pressures between about 1 and about 10 atmospheres in the liquid phase to obtain a major amount of an adduct of the formula



and reducing the N-chloro group of said adduct with sodium sulfite at a temperature of between about −20° to about 100° C.

4. N-chlorocrotyl sulfamide compositions of the formula



wherein R''' is a hydrocarbyl radical having from 1 to 30 carbon atoms and is selected from the group consisting of unsubstituted alkyl and substituted alkyl, phenyl, alkylphenyl and halophenyl and R_2 to R_7 are selected from the group consisting of hydrogen, chlorine, fluorine, alkyl groups having from 1 to 30 carbon atoms and combinations thereof and X is selected from the group consisting of chlorine and hydrogen.

4,170,609

ALDOL CONDENSATION PROCESS

William F. Turner, 5234 Heathercrest, Houston, Tex. 77045

Continuation-in-part of Ser. No. 691,760, Jun. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 389,907, Aug. 20, 1973, abandoned. This application Jun. 13, 1977, Ser. No. 805,772
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—586 C **14 Claims**

1. A process wherein a carbonyl compound is substituted onto the alpha-carbon of an alpha-beta unsaturated carbonyl

compound by contacting said compounds with an aluminum oxycarbonate catalyst.

4,170,610

PREPARATION OF CROSS-LINKED MODIFIED ORGANOPOLYSILOXANES

Bernward Deubzer, Burghausen, Fed. Rep. of Germany, and Erich Brunner, Gmunden, Austria, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 13, 1978, Ser. No. 895,835

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2718998

Int. Cl.[2] C08F *283/12*

U.S. Cl. 525—100 **22 Claims**

1. A process for preparing cross-linked modified organopolysiloxanes which comprises polymerizing at least one monomer having at least one aliphatic multiple bond in the presence of at least one organopolysiloxane capable of being cross-linked and containing at least 40 mol percent of monoorganosiloxane units and a free radical initiator and a catalyst which promotes cross-linking of the organopolysiloxane.

4,170,611

PROCESS FOR PREPARING BONDING AGENTS FOR LIGHT-COLORED WEATHERPROOF WOOD MATERIALS

Friedrich Josten; Martin Cherubim, both of Moers, and Rainer Striso, Kamp-Lintfort, all of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Jan. 5, 1977, Ser. No. 757,111

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1976, 2600435

Int. Cl.[2] C08L *61/28*

U.S. Cl. 525—494 **6 Claims**

1. A process for preparing bonding agents for light-colored weatherproof wood materials based on alkali-condensed phenol-formaldehyde mixed condenstates comprising first preparing a resin solution A by condensing phenol and formaldehyde in a molar ratio of 1:1.5 to 2.5 in the presence of from 0.1 to 1 moles of alkali, relative to phenol, to a viscosity of between 10 and 20 sec. when measured in a 4 mm DIN beaker at 20% and to a solids content of 45–50 wt. %, and preparing a resin solution B by condensing acetone and formaldehyde in a molar ratio of 1:3 to 5 in the presence of 0.01–0.15 moles of alkali, relative to acetone, then adding melamine portion-wise to the acetone-formaldehyde precondensate to a total melamine quantity such that the molar ratio of melamine to acetone lies in the range of 1:1 to 2.5, and condensing to a viscosity of 10–20 sec. when measured in a 4 mm DIN beaker at 20° C. and at a solids content of 45–50 wt. %, then mixing the resin solutions A and B wherein the phenol content of the mixture, relative to phenol plus melamine plus acetone is 10–40 mole % and condensing the mixture for 20–60 minutes at 70–90° C. followed by concentrating the mixture at about 10–20 torr. pressure to a solids content of 60–65 wt. % and a viscosity of 20–100 sec. when measured in a 4 mm DIN beaker at 20° C.

4,170,612

PRESSURE SENSITIVE ADHESIVE COMPOSITIONS

Stephen D. Pastor, Edison, and Martin M. Grover, Upper Montclair, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 13, 1978, Ser. No. 895,957

Int. Cl.[2] C08L *63/00, 43/04, 61/20, 67/00*

U.S. Cl. 525—101 **14 Claims**

1. An improved pressure sensitive adhesive composition comprising

(i) an adhesive base component comprising

(A) from 50 to 85% by weight of an adhesive polymer selected from the group consisting of pressure sensitive polyvinyl ethers, polyesters and silicones having a Williams Plasticity number within the range of 1.4 to 3 mm and a Tg less than or equal to −20° C.,

(B) from 4 to 24% by weight of a chlorosulfonated polyethylene, and

(C) from 11 to 40% by weight of a polymerizable low molecular weight vinyl monomer or polymerizable unsaturated oligomer or mixtures thereof; and

(ii) an initiator comprising a condensation reaction product of a primary or secondary amine and an aldehyde to effect curing of the adhesive base component.

4,170,613

FLEXIBLE EPOXY RESIN COMPOSITION

Kiyonobu Marubashi, Ohmi, Japan, assignor to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1978, Ser. No. 894,953

Int. Cl.[2] C08G *59/02, 59/10, 59/16;* **C08K** *5/01*

U.S. Cl. 525—403 **36 Claims**

1. A settable flexible epoxy resin composition comprising:

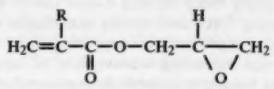
(A) 100 parts by weight of an epoxy resin, and

(B) 5 to 200 parts by weight of a liquid chloroprene copolymer having a number average molecular weight of about 500 to about 10,000 and prepared by free radical copolymerizing

70 to 99 parts by weight of (i) a chloroprene monomer or (ii) at least 50% by weight of a chloroprene monomer plus a monomer copolymerizable with chloroprene, and

1 to 30 parts by weight of one or more monomers selected from the group consisting of

(a) an unsaturated glycidyl ester represented by the formula:



Wherein R is a hydrogen atom, a methyl group or an ethyl group;

(b) a polyfunctional acrylate or a polyfunctional methacrylate; and

(c) an unsaturated carboxylic acid;

in the presence of 0.5 to 20 parts by weight of a mercaptocarboxylic acid based on 100 parts by weight of the monomers.

4,170,614

PROCESS FOR PREPARING HALOGENATED DIARYL HYDROGEN PHOSPHATES

John C. Crano, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 830,543, Sep. 6, 1977, abandoned, which is a division of Ser. No. 634,690, Nov. 24, 1975, Pat. No. 4,059,655. This application Aug. 14, 1978, Ser. No. 933,016

Int. Cl.[2] C07F *9/09*

U.S. Cl. 260—983 **4 Claims**

1. A method for converting a tris(2,6-dihalophenyl) phosphate to a bis(2,6-dihalophenyl) hydrogen phosphate by controlled hydrolysis which substantially avoids the coproduction of progressive degradation products, which comprises:

effecting hydrolysis of a tris(2,6-dihalophenyl) phosphate having the halogens in the 2 and 6 positions of each of its 2,6-dihalophenyl substituents independently selected from the group consisting of bromine and iodine with water in the presence of an inert organic hydrolysis solvent, at a pH between about 1 and 9 and a temperature between about 20° C. and 100° C. for a time between about 15 minutes and 18 hours to form bis(2,6-dihalophenyl) hydrogen phosphate; and

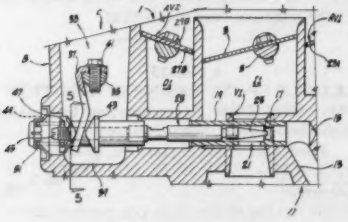
recovering substantially pure bis(2,6-dihalophenyl) hydrogen phosphate.

4,170,615

CARBURETOR WITH SECOND CHOKE BREAK

Ralph E. Kalert, Granite City, Ill., and John C. Green, St. Louis, Mo., assignors to ACF Industries, Inc., New York, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,700
Int. Cl.[2] F02M *1/16*
U.S. Cl. 261—23 A **13 Claims**



1. In a carburetor for an internal combustion engine, said carburetor having at least one induction passage through which air is drawn into said engine, a fuel circuit through which fuel is delivered to said induction passage for mixing with air to form an air-fuel mixture combused in said engine, a choke valve positioned at the inlet of said induction passage and movable between a closed and an open position, means responsive to the temperature of said engine for exerting a closing force on said choke valve to close it, said closing force lessening as engine temperature increases, and means responsive to the vacuum created in said engine when it is running for exerting an opening force on said choke valve which overcomes said closing force and moves said choke valve to an open position, the improvement comprising;

A metering rod extending transversely of said induction passage and having a variable diameter end portion projecting into an outlet of said fuel circuit, said metering rod being movable relative to said fuel circuit outlet to control the quantity of fuel entering said induction passage;

linking means responsive to the movement of said choke valve for moving said metering rod relative to said fuel circuit outlet as said choke valve opens and closes, said variable diameter end portion of said metering rod being withdrawn from said fuel circuit outlet as said choke valve closes and inserted into said fuel circuit outlet as said choke valve opens; and

second means responsive to the vacuum created in said engine for exerting a second opening force on said choke valve, said second vacuum responsive means including means for delaying the exertion of said second opening force on said choke valve until after the first said opening force is exerted thereon, the exertion of said second opening force on said choke valve moving said valve from its first said open position to a second and more fully open position and said variable diameter end portion of said metering rod being inserted further into said fuel circuit outlet by said linking means in response to the movement of said choke valve from its first to its second open position whereby the quantity of fuel delivered to said induction passage is varied by an amount necessary to produce a resultant air-fuel mixture whose air-fuel ratio is both sufficient to keep said engine running and reduce the emissions produced by said engine.

4,170,616

METHOD OF FABRICATION OF A FRESNEL LENS

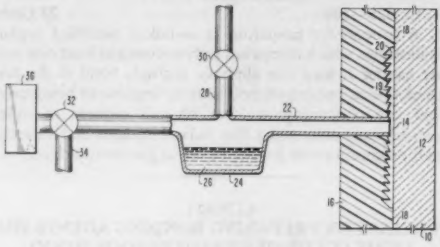
Robert W. Jebens, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 30, 1978, Ser. No. 910,887
Int. Cl.[2] B29D *11/00*
U.S. Cl. 264—1 **5 Claims**

1. A method of fabricating a Fresnel lens, comprised of a thin plastic layer contacted to a transparent substrate, which comprises:

placing a flexible mold against a transparent substrate so as to form a chamber therebetween bounded by the substrate, the extended sides of the mold and the mold face which contains facets which are the negative of the facets of the Fresnel lens to be fabricated and the facet interconnect channels;

inserting a pumping tube, connected to vacuum means and a side reservoir containing a liquid plastic, through the mold and into the chamber formed by said mold and said substrate;



evacuating the air present from said chamber and said pumping tube;

flowing said liquid plastic downward through said pumping tube into said chamber to partially fill said chamber;

venting said pumping tube to the atmosphere thus forcing the liquid plastic to flow along the said facet interconnect channels and fill the chamber due to atmospheric pressure over the plastic;

curing or hardening the plastic; and

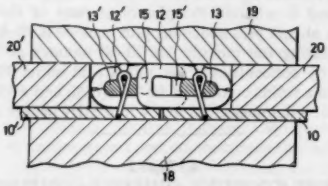
removing the mold; whereby distortion of the mold is presented by having no pressure differential between the interior and exterior of the mold.

4,170,617

METHOD OF FORMING A BOTTOM STOP ON A SLIDE FASTENER

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Oct. 2, 1978, Ser. No. 947,766
Claims priority, application Japan, Oct. 18, 1977, 52-124702
Int. Cl.[2] B29D *5/00*; B29C *27/08*
U.S. Cl. 264—23 **5 Claims**



1. A method of forming a bottom stop on a slide fastener of the type having a pair of stringer tapes each carrying a continuous coupling element forming a row of scoops for mating engagement with the complementary row of scoops formed by the continuous coupling element on the other stringer tape, each coupling element having a filler received therein, which method comprises the steps of:

(a) interengaging at least a preselected number of lowermost scoops of each coupling element with the corresponding number of lowermost scoops of the other coupling element:

(b) compressing the interengaged lowermost scoops from opposite lateral sides thereof, in a direction parallel to the plane of the stringer tapes, thereby causing the coupling heads of the interengaged lowermost scoops of each coupling element to be pressed against the filler received in the other coupling element; and

(c) fusing the interengaged lowermost scoops of the coupling elements for welding them together into a bottom stop.

4,170,618

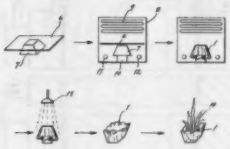
DECORATIVE CONTAINER AND METHOD OF MANUFACTURE

Randolph P. Adams, 738 W. Canterbury, St. Louis, Mo. 63132

Filed Mar. 31, 1977, Ser. No. 783,147

Int. Cl.[2] B29C *17/02*

U.S. Cl. 264—101 **1 Claim**



1. The method for forming a decorative container for a flower pot or other paraphernalia including providing a sheet of thermoplastic polymer material, imprinting a design or other matter upon the sheet of polymer, arranging said imprinted sheet upon a form of desired shape, cutting said sheet to the dimensions approximating the dimensions of the base and side walls of the intended container, locating said form held sheet within a heater, reducing the atmospheric pressure within the heater before elevating its temperature, elevating the temperature within the heater to a range of between about 250° to 350° F., maintaining said form held sheet within the heated environment of the heater for a time of between about one to ten minutes and until said sheet folds under the influence of the heat complementary about its form, and then removing said sheet from the heater and cooling it by exposing it to a spray of cool water until it reaches an ambient temperature.

4,170,619

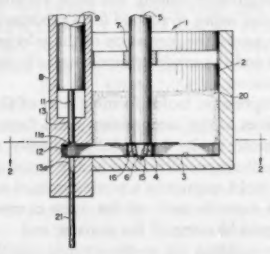
METHOD AND APPARATUS FOR DISPENSING SALT POWDER AS PELLETS IN LAMP MAKING

Elmer G. Fridrich, Chardon, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,115

Int. Cl.[2] D04H *1/16*

U.S. Cl. 264—113 **4 Claims**



1. A method of producing frangible salt sticks made up of segments, each segment comprising a predetermined quantity of metal salt, comprising:

intermittently loading charges of salt in powder form into a sized channel in a die, said channel having a length several times its transverse dimension in order to develop frictional resistance at the walls adequate to compress the charge as it is forced through,

and compressing the charges one at a time into the channel against prior charges forced therethrough and compressed into a salt stick, whereby said charges are added to said stick as weakly bonded segments.

4,170,620

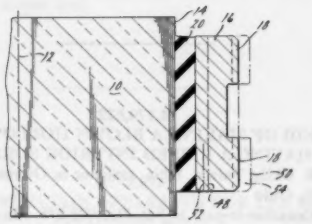
PROCESS FOR MAKING AND ASSEMBLING A ROTARY REGENERATOR AND DRIVE GEAR CONSTRUCTION

V. Durga Nageswar Rao, Bloomfield Hills; Christian J. Rahnke, Orchard Lake; Carlo A. Fucinari, Southfield, and James K. Vallance, Northville, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1977, Ser. No. 864,079

Int. Cl.[2] B29D *3/00, 15/00;* B29H *3/00*

U.S. Cl. 264—230 **6 Claims**



1. A process for forming a regenerator assembly comprising the steps of mounting a glass ceramic cylindrical regenerator core and a metallic ring in a fixture with the ring surrounding the periphery of the core in radially spaced relationship, an annular space thus being defined between the periphery of the core and the inside diameter of the ring, inserting in the annular space at least one heat shrinkable element, injecting elastomeric material in the annular space surrounding said element, and curing said elastomeric material with heat to shrink said element and form a cavity in said elastomeric material to form a torque transmitting path between the ring and the core with sufficient compliance to resist development of excessive stresses in the core.

4,170,621

THERMOFORMING APPARATUS AND METHOD OF MOTION CONTROL

Günther Kiefer, Schwaigern, Fed. Rep. of Germany, assignor to Adolf Illig Maschinenbau GmbH & Co., Heilbronn, Fed. Rep. of Germany

Filed Sep. 20, 1978, Ser. No. 943,977

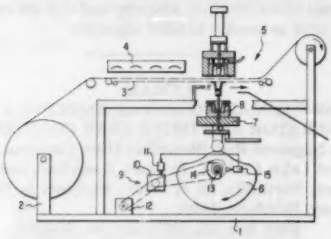
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 2743058

Int. Cl.[2] B29C *17/03*

U.S. Cl. 264—322 **7 Claims**

1. A method of controlling the reciprocating motion of a mold-carrying platen in a thermoforming apparatus which includes a driven cam disc operatively connected to the platen to move the platen in each cycle of operation upward from a lower, open position to an upper, closed position, to maintain the platen in the upper position, to move the platen downward from the upper position to the lower position and to maintain the platen in the lower position; comprising the step of selectively driving said cam within each cycle of operation with a first rpm for determining a maximum speed for the upward motion of the platen and a minimum dwelling period in said lower position and a second rpm for determining a minimum dwelling period in said upper position and a maximum speed for the downward motion of the platen; said second rpm being

set as a function of the properties of the article manufactured by the thermoforming apparatus; said driving step including



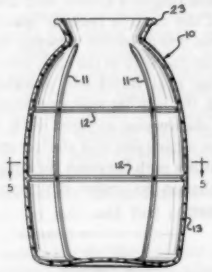
the step of switching from one of said rpm's to the other as a function of the angular position of said cam disc.

4,170,622

METHOD OF MAKING A BLOWN HOLLOW ARTICLE HAVING A RIBBED INTERIOR SURFACE

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 802,275, May 26, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,655
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—520 **2 Claims**



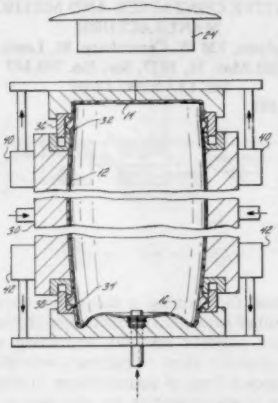
1. In a blow molding method for forming a hollow article from a thermoplastic material tubular parison heated to a moldable temperature, a method for forming internal integral reinforcement ribs in the article comprising the steps of: blow molding the heated thermoplastic material parison to form a hollow parison preform slightly smaller than the article and with concave grooves in an exterior surface of said parison preform and corresponding opposing adjacent convex ribs in an interior surface of said parison preform at locations to be reinforced in the finished article, blow molding the finished article by expanding said parison preform in a final blow mold cavity with sufficient force and while the thermoplastic material is still heated to collapse and fuse the facing walls of each of said concave grooves to form a final article having integral solid internal reinforcement ribs and a continuous exterior surface, wherein the walls of the final blow mold are colder than said parison preform and thus freeze the surface of the article blown therein, except at the surfaces of the grooves which do not contact the mold wall and thus remain relatively hot and thus with continued blowing the rib material deforms and fills the groove gaps to form said ribs and said continuous exterior surface.

4,170,623

METHOD OF BLOW MOLDING AN ALL PLASTIC DRUM AND COMPRESSION MOLDING A PROJECTION THEREON

Robert A. Dubois, and George F. Smith, both of Marion, Ohio, assignors to Greif Bros. Corporation, Delaware, Ohio

Continuation-in-part of Ser. No. 888,197, Mar. 20, 1978. This application Jun. 28, 1978, Ser. No. 920,061
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—534 **5 Claims**



1. A method of molding a plastic drum having at least two outwardly extending projections comprising the steps of:

extruding a tubular parison of resin material having a predetermined wall thickness with at least two sections thereof having an additional amount of resin of increased thickness for formation of the projections and at the same time assure a predetermined wall thickness of the drum adjacent the projections no less than that at the remaining portions of the drum to avoid having a zone of weakness at such locations with the extrusion being programmed to locate each section of additional thickness to facilitate the formation of each of the projections;

utilizing a longitudinally split blow molding for cooperating and forming the selected drum configuration and blow molding the parison into the selected drum configuration when the parison is disposed interiorly of the closed split blow mold, the parison being thus blown into the selected drum configuration during the blow molding cycle and such blowing being continued for a predetermined period of time to assure the formation of the selected drum configuration and the predetermined wall thickness adjacent the projections;

utilizing compression molds forming part of the blow mold with surfaces of the compression mold forming the compression mold cavity being longitudinally reciprocal in essentially the same direction as the longitudinal axis of the blow mold, capturing a predetermined amount of the additional resin in each of the open compression mold cavities upon blowing of the parison; and

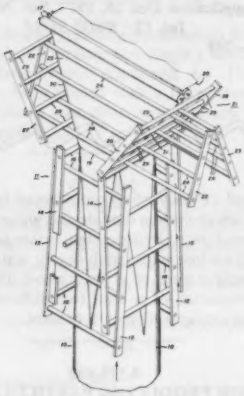
compression molding the predetermined additional amount of resin into each of the projections upon longitudinally reciprocating the compression mold into its closed position, and at the same time assuring the predetermined wall thickness adjacent the projection, the compression molding of the projection taking place during the blow molding cycle and after the initiation of the blow molding cycle.

4,170,624

BLOWN TUBE COLLAPSE FRAME ASSEMBLY

Charles Dawson, Marblehead, Mass., assignor to General Electric Company, Hudson Falls, N.Y.

Division of Ser. No. 666,508, Mar. 12, 1976, Pat. No. 4,068,999, which is a continuation-in-part of Ser. No. 349,643, Apr. 9, 1973, abandoned. This application Aug. 12, 1977, Ser. No. 824,082
Int. Cl.[2] B29C *15/00*
U.S. Cl. 264—564 5 Claims



1. A method of collapsing a continuously moving insufflated tube of thermoplastic material which comprises

a. changing the cross section of said tube into a substantially square cross section by gradually converging said tube over an extended length thereof to a square section tube,

b. diverging said square section tube to a flat or line section by passing said square section tube through flattening roller means,

c. supporting the diverging tube in said flattening roller means in four planes to channel the diverging tube into progressively rectangular sections of progressively decreasing thicknesses and increasing widths going into said line section,

d. and maintaining the diverging angle of the four planes essentially equal so that points on said square section arrive at said line section along lines essentially perpendicular thereto.

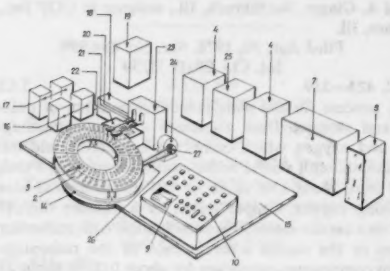
4,170,625

AUTOMATIC ANALYZER DEVICE FOR CARRYING OUT CHEMICAL-CLINICAL AND KINETIC-ENZYMATIC ANALYSES ON FLUIDS, PARTICULARLY BIOLOGICAL FLUIDS

Henry H. Welch, No. 437, Via Nomentana, 00162 Roma, Italy

Filed May 24, 1978, Ser. No. 908,992
Int. Cl.[2] G01N *1/14, 1/18*
U.S. Cl. 422—64 14 Claims

1. A two-channel analyzer for the analysis of liquid samples comprising, in combination: a rotatable plate comprising and internal circular sample plate portion adapted to carry a single row of a number of oval shaped sample-containing cups and an external circular analytical plate portion adapted to carry two concentric and parallel rows of reaction test-tubes, said plate portions being radially aligned so that each sample-containing cup corresponds to and is radially aligned with two reaction test tubes; means to rotate stepwise said circular plate; a first moving-arm located above both said plate portions for aspirating two samples to be analyzed at one time from a single oval sample-cup and for transferring the aspirated samples including a wash-solution and respective reagents into two separate reaction test tubes to form a pair of solutions; and a second moving-arm located above said analytical plate portion for aspirating the solutions from two separate reaction test tubes



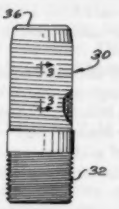
and transferring the two solutions simultaneously for separate measurement at one time.

4,170,626

GAS DISTRIBUTION APPARATUS FOR USE WITH FLUIDIZED BEDS

Lois M. Cutter, Minneapolis, Minn.; John R. Crawford, Arlington Heights, and Gregory J. Thompson, Waukegan, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jul. 6, 1978, Ser. No. 922,461
Int. Cl.[2] B01J *8/00*
U.S. Cl. 422—143 3 Claims



1. Apparatus for uniformly distributing a gas to a fluidized bed having a particle size in the range of 20–150μ comprising gas supply manifold means mounted at the bottom of said bed, said manifold means having a plurality of flow distribution members threadedly engaged therewith and projecting generally vertically upwardly therefrom, each of said flow distribution members having a closed top portion and being of a generally tubular configuration, the walls of said members being defined over the major portion of their length by a continuous helical configured wire having a relatively flat outer surface and inwardly tapered converging side surfaces which are separated at their inner ends by a rounded inner surface which is welded at spaced points along its length to a plurality of inner longitudinal rod members to define a continuous helical slot having a width no greater than about 75μ, said slots serving to distribute gas from said manifold means horizontally through a fluidized bed in which said flow distribution members are mounted while preventing substantially all inward movement of the particles forming the bed through said slots when the outward flow of gas through said slots is terminated so as to produce a negative pressure within said distribution members.

4,170,627

PROCESS FOR THE SIMULTANEOUS SEPARATION OF SULFUR AND NITROGEN OXIDES FROM A GASEOUS MIXTURE

Edward A. Ginger, Northbrook, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 10, 1978, Ser. No. 894,959
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—239 7 Claims

1. A process for the simultaneous separation of oxides of sulfur and nitrogen from a gaseous mixture containing said oxides and oxygen which comprises contacting said mixture and ammonia with a solid sulfur oxides acceptor at a temperature of from about 150° to about 450° C., said solid acceptor comprising copper, copper oxide, or a mixture thereof dispersed on a carrier material in combination with ruthenium and rhenium or the oxides wherein each of the ruthenium and rhenium components comprises for about 0.01 to about 2.0 wt. % of said solid acceptor calculated as the elemental metal.

4,170,628

PROCESS FOR REMOVING SO_2 FROM EFFLUENT GASES AND FOR REMOVING HEAT STABLE SALTS FROM SYSTEMS IN WHICH THEY ACCUMULATE USING AN ANION EXCHANGE RESIN

Alexander J. Kosseim, Yorktown Heights; David A. Dunnery, New York, and Gilbert R. Atwood, Briarcliff Manor, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 781,166, Mar. 25, 1977, abandoned.
This application May 30, 1978, Ser. No. 910,521
Int. Cl.[2] C01B *17/00*
U.S. Cl. 423—243 19 Claims

1. In a process for the selective removal of sulfur dioxide with respect to carbon dioxide from a gas mixture containing same wherein

(a) said gas mixture is contacted with a mainstream of an aqueous absorbent solution to remove sulfur dioxide from said gas mixture and form a rich aqueous absorbent solution enriched in sulfur dioxide removed from the gas mixture,

(b) a mainstream of said rich aqueous absorbent solution is moved to a stripping zone where sulfur dioxide is removed to form a lean aqueous absorbent solution depleted in sulfur dioxide content, and

(c) a mainstream of said lean aqueous absorbent solution is recycled from the stripping zone and re-contacted with said gas mixture,

the improvement comprising

1. using an aqueous alkanolamine or sulfites thereof as the aqueous absorbent solution;
2. performing the stripping step of step (b) so that the residence time of said aqueous absorbent solution in said stripping zone is from about 3 to about 30 minutes and said stripping zone is operated at a reduced pressure of about 50 to about 350 mm. Hg. and a temperature of about 80° to 100° C. to thereby minimize the formation of sulfate, thiosulfate and thionate anions;
3. separating a portion of said aqueous absorbent solution containing accumulated sulfate, thiosulfate and thionate anions from said mainstream of lean aqueous absorbent;
4. contacting said separate portion with an anion exchange resin having hydroxyl anions displaceable by said sulfate, thiosulfate and thionate anions to remove same from said portion whereby the hydroxyl anions of the resin are replaced by said sulfate, thiosulfate and thionate anions;
5. returning said portion after contact with said anion exchange resin to one of said mainstreams; and
6. regenerating said anion exchange resin by contacting it with aqueous alkaline inorganic hydroxide to replace the sulfate, thiosulfate and thionate anions on said resin with hydroxyl anions thereby forming a waste stream containing said sulfate, thiosulfate and thionate anions, whereby sulfate, thiosulfate and thionate anions are removed from said aqueous absorbent solution.

4,170,629

METHOD OF CONVERTING HYDROCARBON WASTE GAS STREAMS USING A NON-UNIFORM CRIMPED METAL RIBBON PACKED CATALYST BED

Erwin C. Betz, 524 Mill Vallye Rd., Palatine, Ill. 60067

Division of Ser. No. 613,544, Sep. 15, 1975, Pat. No. 4,065,268.
This application Oct. 25, 1977, Ser. No. 844,744
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—245 10 Claims

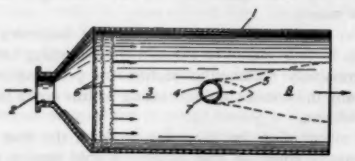
1. A method of converting unsaturated hydrocarbons in a waste gas stream to carbon dioxide and water which comprises passing the unsaturated hydrocarbon waste gas stream through a catalyst bed packed with catalytically active crimped metal ribbon at a temperature of at least about 100° C., wherein a substantial proportion of at least two different repeating non-random crimp configurations are present.

4,170,630

METHOD FOR PRODUCING PARTICULATE SOLIDS IN A TURBULENT WAKE BURNER

Harold E. Hoelscher, Pittsburgh, Pa., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 873,072, Oct. 31, 1969, abandoned.
This application Jun. 13, 1974, Ser. No. 479,075
Int. Cl.[2] C01B *21/06, 13/14*
U.S. Cl. 423—409 7 Claims



1. A process for reacting gaseous materials to produce a particulate solid product which comprises introducing a primary reactant into a reactor having a primary reactant inlet and at least one tubular secondary reactant conduit traversing the path of said primary reactant through said reactor, said tubular conduit being of such size and position that substantial flow of primary reactant therearound within said reactor is permitted, said introducing being with sufficient velocity to establish a primary reactant stream with a Reynolds Number of at least 50 based upon the diameter of each said secondary reactant conduit, introducing a secondary reactant through said secondary reactor conduit into the path of the primary reactant stream to cause said reactants to flow in the same direction, maintaining the relative velocities of said reactants at a level which leads to the formation of a wake around each secondary reactant conduit and prevents flashback of the reaction to any point upstream of the secondary reactant conduit, allowing the reactants to contact each other under conditions which permit reaction for producing particulate solid product to occur downstream and remote from the secondary reactant inlets, whereby buildup of product at the reactant inlets is prevented or avoided.

6. The process of claim 1 wherein the secondary reactant is selected from the group consisting of vaporous metals and metal salts.

7. The process of claim 6 wherein the primary reactant is selected from the group consisting of oxygen and ammonia.

4,170,631

CONTROLLED RELEASE FORMULATIONS OF DOUGLAS-FIR BEETLE ANTI-AGGREGATIVE PHEROMONE, 3-METHYL-2-CYCLOHEXEN-1-ONE

James W. Young, Palo Alto, Calif., and Malcolm M. Furniss, Moscow, Id., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 31, 1978, Ser. No. 929,866
Int. Cl.[2] A01N *5/00, 9/00*
U.S. Cl. 424—19 **2 Claims**

1. A controlled release repellant composition for Douglas-fir beetles (*Dendroctonus pseudotsugae* Hopk.) which comprises 3-methyl-2-cyclohexen-1-one contained on 13x molecular sieves which have been coated with a 1:1 mixture of paraffin wax and polyethylene wax after impregnation with said 3-methyl-2-cyclohexen-1-one.

4,170,632

PLAQUE INHIBITING COMPOSITIONS AND METHOD

Austin C. Wagenknecht, deceased, late of Hennepin County, Minn. (by Don Austin Wagenknecht, personal representative); George V. Daravingas, Edina, and William E. Koski, Minneapolis, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Nov. 28, 1977, Ser. No. 855,526
Int. Cl.[2] A61K *9/68*
U.S. Cl. 424—48 **7 Claims**

1. A chewing gum comprising:
(a) from about 10% to about 95% by weight of a gum base;
(b) from about 0.001% to about 15% by weight of a mixture of a zinc compound and a plaque inhibiting flavor selected from the group consisting of cinnamon oil, peppermint oil and spearmint oil and mixtures thereof in a weight ratio of from about 1,000:1 to about 1:1,000.

4,170,633

PLAQUE INHIBITING COMPOSITION AND METHOD

Austin C. Wagenknecht, deceased, late of Hennepin County, Minn. (by Don A. Wagenknecht, personal representative); George V. Daravingas, Edina, and William E. Koski, Minneapolis, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Nov. 28, 1977, Ser. No. 855,512
Int. Cl.[2] A61K *9/68*
U.S. Cl. 424—48 **8 Claims**

1. A chewing gum comprising:
(a) from about 10% to about 95% by weight gum base; and,
(b) from about 0.001% to about 15% by weight of an alkyl sulfate salt.

4,170,634

MODIFIED ABRASIVE SYSTEM FOR DENTIFRICES

Martin Cordon, Highland Park, and James Norfleet, Plainfield, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 544,618, Jan. 28, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 759,617
Claims priority, application Australia, Jan. 21, 1976, 10444/76
Int. Cl.[2] A61K *7/16, 7/18*
U.S. Cl. 424—49 **6 Claims**

1. A dentifrice of superior cleaning and polishing characteristics containing as the essential ingredients, an abrasive system having at least one soft abrasive and including a hard abrasive having a particle size of about 1 to 15 microns in diameter selected from the group consisting of calcined alumina, zirconium silicate, feldspar, pumice, and ZrO_2, and in an amount to provide a radioactive enamel abrasion value to the dentifrice of above about 400 and present in an amount of at least 7.5% and up to 20% by weight of the dentifrice, and a non-toxic zinc compound in an amount to provide at least about 0.0065% zinc to the dentifrice, said abrasive system being pretreated with a water-soluble zinc compound selected from the group consisting of zinc chloride, zinc sulfate, zinc acetate, zinc nitrate in an amount of about 0.01–2.0% by weight of the dentifrice, so as to reduce the enamel abrasion of the dentifrice.

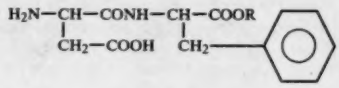
4,170,635

FLAVORED DENTIFRICE

Jordan B. Barth, East Brunswick, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 502,043, Aug. 30, 1974, Pat. No. 3,939,261. This application Feb. 9, 1976, Ser. No. 656,720
The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.
Int. Cl.[2] A61K *7/16*
U.S. Cl. 424—49 **7 Claims**

1. An anhydrous paste, cream or gel dentifrice composition which contains about 10 to 90% by weight of a liquid vehicle including an orally-acceptable oil having a viscosity ranging from about 100 to about 300 centipoises at 70° F., about 0.1 to about 10% of a dipeptide sweetener having the formula



wherein R is C_{1-2} alkyl and about 0.1 to about 15% of an orally acceptable acid anhydride.

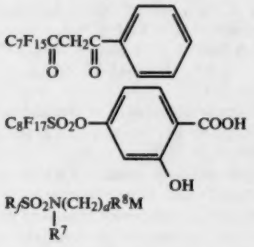
4,170,636

COMPOSITION AND METHOD FOR INHIBITING PLAQUE FORMATION

Michael R. Engel, White Bear Lake; Robert W. H. Chang, Shoreview, and Linda L. LaFleur, Oakdale, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 29, 1977, Ser. No. 865,680
Int. Cl.[2] A61K *7/18*
U.S. Cl. 424—52 **16 Claims**

1. A dentifrice composition comprising at least one ingredient selected from the group consisting of caries prophylatic agents, polishing agents, surfactants, flavoring agents, sweetening agents, thickening agents and humectants, said ingredients being substantially free from polyvalent metal ions, and at least 0.05% by weight of a fluorochemical compound selected from

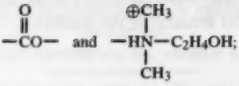


wherein

R_f is a fluorinated, saturated, aliphatic radical having from about 4 to 16 carbon atoms;

R^7 is selected from hydrogen, methyl and ethyl;

R^8 is selected from



M is selected from hydrogen, sodium, potassium, $-HN(CH_2CH_2OH)_3$; $-H_2PO_4^{\ominus}$; and $-NO_3^{\ominus}$ and d is an integer from 1 to 10.

4,170,637

FROSTING BLEACH COMPOSITION

Franz J. Pum, Canoga Park, Calif., assignor to Redken Laboratories, Inc., Canoga Park, Calif.

Filed May 16, 1977, Ser. No. 797,564
Int. Cl.[2] A61K *7/135*
U.S. Cl. 424—62 **9 Claims**

1. A bleach composition for frosting of hair comprising an intimate mixture of at least one particulate persulfate salt and at least one particulate alkali silicate in an anhydrous organic carrier base provided in an amount sufficient to coat the particles present and form a mixture of paste to cream in consistency, the organic carrier base being sufficiently hydrophobic to substantially prevent absorption of atmospheric moisture by the mixture, and sufficiently hydrophilic to enable dispersion of the mixture in an aqueous solution of hydrogen peroxide.

4,170,638

METHOD FOR PRODUCING A DEODORANT

Joseph L. Owades, Boston, Mass., assignor to S. S. Steiner, Inc., New York, N.Y.

Continuation of Ser. No. 739,305, Nov. 5, 1976, abandoned. This application May 11, 1978, Ser. No. 904,775
Int. Cl.[2] A61K *7/32*
U.S. Cl. 424—65 **11 Claims**

1. A method for producing a deodorant composition for applying to human skin to inhibit growth of gram-positive bacteria thereon, said method comprising the steps of:

contacting the flower of the humulus lupulus plant with an organic solvent under conventional extraction conditions to obtain an extract containing humulones and lupulones, and

admixing said extract with a carrier therefor, which carrier is selected from the group consisting of a liquid soap, a solid soap, a cream, a paste, an aerosol spray, a powder and a stick.

4,170,639

ANTIHEMOPHILIC FACTOR CONCENTRATE AND ITS PRODUCTION

Daniel T. H. Liu, Troy; John F. Irwin, Grosse Pointe Park, and Rong-Chang Pai, Troy, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 10, 1978, Ser. No. 923,139
Int. Cl.[2] A61K *35/16*
U.S. Cl. 424—101 **10 Claims**

1. Process for the production of antihemophilic factor concentrate in purified form having enhanced potency and solubility comprising the steps of

(a) subjecting an aqueous extract of antihemophilic blood plasma cryoprecipitate to purification by mixing with an aluminum hydroxide adsorbent at an acid pH and precipitating unwanted protein in the cold, the pH conditions being such that unwanted protein is selectively removed by adsorption without substantial loss of antihemophilic factor potency from the aqueous extract,

(b) constituting the purified aqueous extract with buffer and saline and adjusting to an acid pH, and

(c) freeze-drying the thus adjusted aqueous extract.

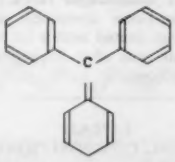
4,170,640

ANTIBIOTIC MIXTURES

Geoffrey W. Grigg, Lane Cove, and Wolfgang H. F. Sasse, Malvern East, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australia

Filed Apr. 17, 1978, Ser. No. 897,021
Claims priority, application Australia, Apr. 21, 1977, PC9844
Int. Cl.[2] A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 **5 Claims**

TYPE 3



1. A method of potentiating the antibiotic activity of phleomycin or bleomycin which comprises administering phleomycin or bleomycin in association with a triphenylmethane dye.

4,170,641

1-N-(ω-AMINOALKANESULFONYL) DERIVATIVE OF AMINOGLYCOSIDIC ANTIBIOTIC AND PROCESS FOR PREPARATION THEREOF

Eiichi Akita, Kamakura; Yukio Horiuchi, Tokyo; Takeo Miyazawa, Tokyo, and Hamao Umezawa, Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Jun. 1, 1978, Ser. No. 911,522
Claims priority, application Japan, Jun. 10, 1977, 52/68005
Int. Cl.[2] A61K *31/71*; C07H *15/22*
U.S. Cl. 424—180 **12 Claims**

1. A compound of the formula:

$$RNHSO_2(CH_2)_nNH_2$$

or a pharmaceutically acceptable salt thereof, wherein RNH—represents the residue of an aminoglycosidic antibiotic comprising a 2-deoxystreptamine moiety in its molecule, the nitrogen atom in the residue RNH—being bonded to the carbon atom at the 1-position of the 2-deoxystreptamine moiety, and n represents an integer of 2, 3, or 4.

11. An antibacterial composition comprising as the active ingredient an antibacterially effective amount of a 1-N-(ω-aminoalkanesulfonyl) derivative of an aminoglycosidic antibiotic as defined in claim 1, in combination with a pharmaceutically acceptable carrier for the active ingredient.

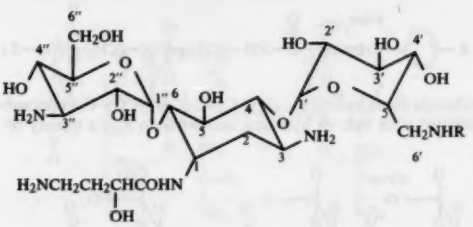
4,170,642

DERIVATIVES OF KANAMYCIN A

Hamao Umezawa; Kenji Maeda, both of Tokyo, Shinichi Kondo, Yokohama; Sumio Umezawa, Tokyo; Osamu Tsuchiya, Yokohama; Shunzo Fukatsu, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Continuation-in-part of Ser. No. 402,085, Oct. 1, 1973, Pat. No. 4,001,208. This application Mar. 12, 1975, Ser. No. 557,590
Claims priority, application Japan, Mar. 22, 1974, 49-31548
Int. Cl.[2] A61K *31/71*; C07H *15/22*
U.S. Cl. 424—180 **8 Claims**

1. 1-N-(L-4-amino-2-hydroxybutyryl)-6'-N-alkylkanamycin having the formula:



wherein R is methyl or ethyl, and the pharmaceutically acceptable acid addition salt thereof.

5. A process for therapeutically treating bacterial infections in living animals, which comprises administering a therapeutically effective amount of a compound according to claim 1 to an animal affected with a susceptible bacterial infection.

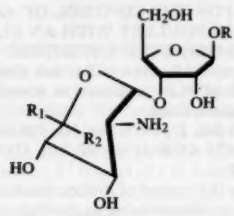
4,170,643

AMINOGLYCOSIDE-AMINOCYCLITOL DERIVATIVES AND METHOD OF USE

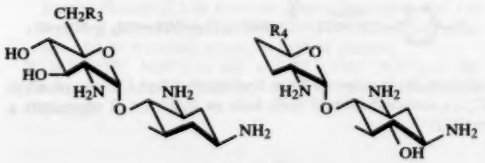
Stephan Gero, Orsay; Daniel Mercier; Alain Olesker, both of Gif-sur-Yvette, and Andre Cier, Neuilly-sur-Seine, all of France, assignors to Labaz, Paris, France

Filed Apr. 13, 1977, Ser. No. 787,040
Int. Cl.[2] A61K *31/71;* **C07H** *15/22*
U.S. Cl. 424—181 **15 Claims**

1. Aminoglycoside-aminocyclitol derivatives corresponding to the formula:

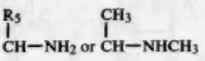


wherein R_1 and R_2, which are different, represent hydrogen or CH_2NH_2 and R is selected from the group consisting of:



A = and B =

wherein R_3 represents NH_2 or OH and R_4 represents



wherein R_5 represents hydrogen or methyl and the pharmaceutically acceptable acid addition salts thereof.

7. A pharmaceutical composition containing as active principle at least one compound according to claim 1, in association with a pharmaceutical carrier or excipient therefor.

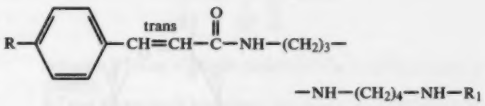
4,170,644

METHOD FOR THE CONTROL OF *BORDETELLA BRONCHISEPTICA* IN SWINE WITH ANTIBIOTIC BM123γ

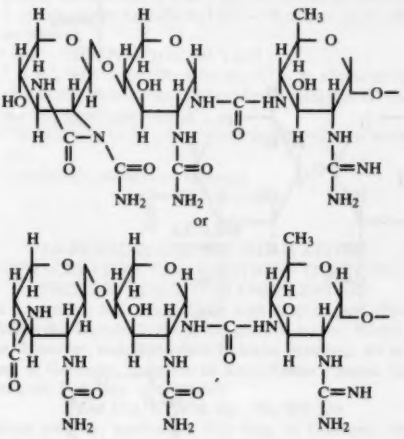
Richard H. Gustafson, Lawrenceville, and Gordon A. Kemp, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 17, 1978, Ser. No. 925,663
Int. Cl.[2] A61K *31/71*
U.S. Cl. 424—181 **7 Claims**

1. A method for the control of *Bordetella bronchiseptica* infections in swine, comprising administering orally or parenterally to the animals a pharmaceutically effective amount of antibiotic BM123γ of formula:



wherein R_1 is hydrogen, alkyl C_1–C_{10}, alkyl C_2–C_6 mono-substituted with halo or hydroxy; and wherein R is a moiety of:



or mixtures thereof; or pharmaceutically acceptable salts thereof.

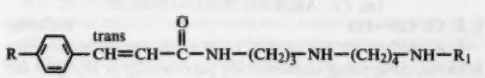
4,170,645

ANTIBACTERIAL AGENT BM123γ, SALTS AND ALKYL DERIVATIVES THEREOF FOR THE CONTROL OF SHIPPING FEVER IN CATTLE

Richard H. Gustafson, Lawrenceville, and Gordon A. Kemp, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

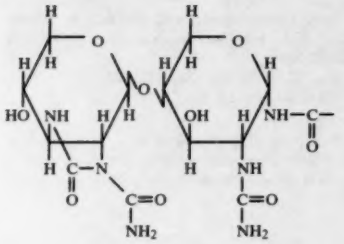
Filed Jul. 17, 1978, Ser. No. 925,660
Int. Cl.[2] A61K *31/71, 31/415, 31/35*
U.S. Cl. 424—181 **7 Claims**

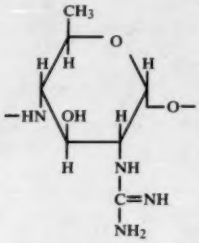
1. A method for the control of shipping fever in cattle comprising administering parenterally to the animals a pharmaceutically effective amount of antibiotic BM123γ represented by formula:



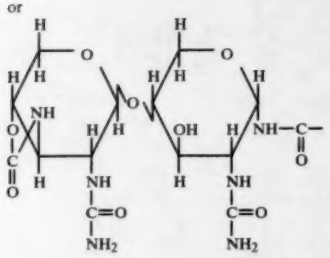
wherein R_1 is hydrogen, alkyl C_1–C_{10}, halo substituted alkyl

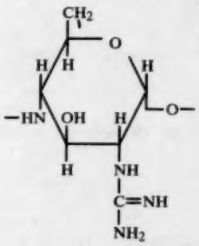
C_2–C_6, or hydroxy substituted alkyl C_2–C_6; and wherein R represents a moiety of:





or





or mixtures thereof; or pharmaceutically acceptable salts thereof.

4,170,646

METHOD FOR THE CONTROL OF *MYCOPLASMA HYOPNEUMONIAE* IN SWINE WITH ALKYLATED BM123γ TYPE ANTIBIOTICS

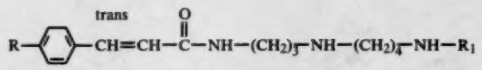
Richard H. Gustafson, Lawrenceville, and Gordon A. Kemp, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 17, 1978, Ser. No. 925,659

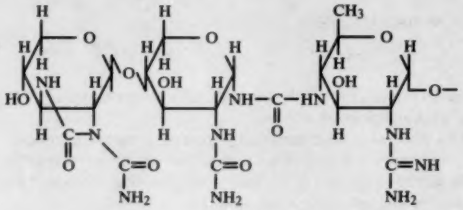
Int. Cl.[2] **A61K** *31/71, 31/415, 31/35*

U.S. Cl. 424—181 **6 Claims**

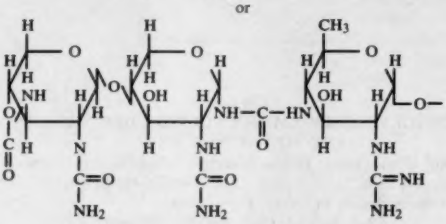
1. A method for the control of *Mycoplasma hyopneumoniae* in swine, comprising administering parenterally or orally to the animals a pharmaceutically effective amount of antibiotic BM123γ of formula:



wherein R_1 is hydrogen, alkyl C_1–C_{10}, alkyl C_2–C_6 monosubstituted with halo or hydroxy; and wherein R is a moiety of:



or



or mixtures thereof; or pharmaceutically acceptable salts thereof.

4,170,647

METHOD FOR THE CONTROL OF *ARIZONA HINSHAWII* IN POULTRY WITH AN ALKYLATED BM123γ-TYPE ANTIBIOTIC

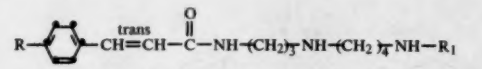
Richard H. Gustafson, Lawrenceville, and Gordon A. Kemp, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 17, 1978, Ser. No. 925,662

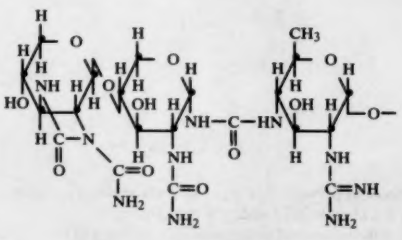
Int. Cl.[2] **A61K** *31/71, 31/415, 31/35*

U.S. Cl. 424—181 **7 Claims**

1. A method for the control of *Arizona hinshawii* infections in poultry comprising, administering parenterally or orally to the birds an effective amount for the control of the infections of antibiotic BM123γ of formula:

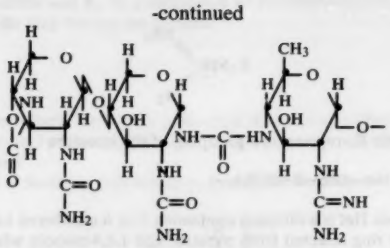


wherein R_1 is selected from hydrogen, alkyl C_{1-C10}, or alkyl C_{2-C6} monosubstituted with halo or hydroxy; R represents a moiety:



or

-continued



and mixtures thereof; and pharmaceutically acceptable salts thereof.

4,170,648

PHOSPHONOTHIOUREIDE ANTHELMINTICS

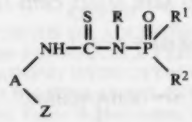
Ronald P. Owen, Warminster; George A. Miller, Glenside, both of Pa., and Charles M. Schneider, Cullowhee, N.C., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 717,411, Aug. 24, 1976, Pat. No. 4,086,336, which is a continuation-in-part of Ser. No. 354,630, Apr. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 259,423, May 26, 1972, abandoned. This application Feb. 10, 1978, Ser. No. 876,779

Int. Cl.[2] **A01N** *9/22;* **C07D** *213/02;* **C07F** *9/22*

U.S. Cl. 424—200 **11 Claims**

1. A compound of the formula:



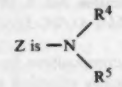
or a pharmaceutically acceptable metal salt, acid salt or metal salt complex thereof wherein A is pyridinylene unsubstituted or substituted by one or two members selected from the group consisting of halo, cyano, thiocyano, carboxy, nitro, di-lower alkylamino, vicinal alkylene of 2 to 6 carbon atoms, vicinal alkylenedioxy of 1 to 4 carbon atoms or a moiety of the formula $R^3(X)_n$ wherein R^3 is alkyl of 1 to 8 carbon atoms or aryl of 6 to 10 carbon atoms;

X is oxo, thio, sulfinyl, sulfonyl or carbonyl;

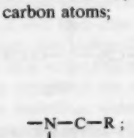
n is zero or 1;

R is hydrogen, alkyl of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, cycloalkyl of 5 or 6 carbon atoms, alkoxyalkyl of 2 to 6 carbon atoms, cyanoalkyl of 1 to 4 carbon atoms, alkenyl of 3 or 4 carbon atoms, haloalkenyl of 3 or 4 carbon atoms, alkynyl of 3 or 4 carbon atoms, haloalkynyl of 3 or 4 carbon atoms, benzyl or phenyl;

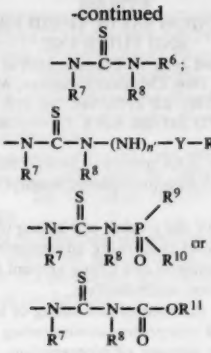
R^1 is R′, OR′, $N(R')_2$ or SR′ and R^2 is OR′, $N(R')_2$ or SR′ wherein R′ is an aliphatic moiety of 1 to 8 carbon atoms or phenyl;



wherein R^4 and R^5 are each hydrogen or an aliphatic moiety of 1 to 8 carbon atoms;



-continued



wherein R^6 is an aliphatic moiety of 1 to 8 carbon atoms or phenyl;

R^7 and R^8 are each hydrogen, alkyl of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, cycloalkyl of 5 or 6 carbon atoms, alkoxyalkyl of 2 to 6 carbon atoms, cyanoalkyl of 1 to 4 carbon atoms, alkenyl of 3 or 4 carbon atoms, haloalkenyl of 3 or 4 carbon atoms, alkynyl of 3 or 4 carbon atoms haloalkynyl of 3 or 4 carbon atoms, benzyl or phenyl;

R^9 is R″, OR″, $N(R'')_2$ or SR″; and

R^{10} is R″, $N(R'')_2$ or SR_2 wherein R″ is an aliphatic moiety of 1 to 8 carbon atoms or phenyl provided that R^9 and R^{10} are not simultaneously R″;

R^{11} is alkyl of 1 to 8 carbon atoms or phenyl; n′ is zero or **1**; and

Y is carbonyl, sulfinyl or sulfonyl.

4,170,649

1,4-BENZODIAZEPINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS THEREOF, AND PROCESS FOR THEIR PREPARATION

Hans Liepmann; Rolf Hueschens, both of Hanover; Wolfgang Milkowski, Burgdorf; Horst Zeugner, Hanover; Renke Budden, Hanover, and Jacqueline Bahlsen, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

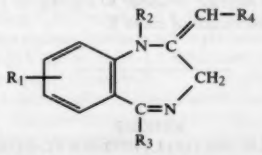
Filed Dec. 5, 1978, Ser. No. 996,720

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1977, 2754112

Int. Cl.[2] **A61K** *31/55;* **C07D** *243/16*

U.S. Cl. 424—244 **19 Claims**

1. A compound selected from the group of 1,4-benzodiazepines of the formula I



I

wherein

R_1 represents hydrogen, halogen, or nitro;

R_2 represents hydrogen, or lower alkyl;

R_3 represents phenyl, or phenyl which is substituted by halogen or trifluoromethyl; and

R_4 represents cyano or carbamoyl

and pharmaceutically-acceptable acid addition salts thereof.

19. A pharmaceutically composition comprising a tranquilizing effective amount of a least one pharmacologically-active compound as defined in claim **1** and a pharmaceutically acceptable diluent.

4,170,650
OXOPIPERAZINIUM SALTS, THEIR PREPARATION AND THEIR USE

Nancy J. Morris, and John W. Bozzelli, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 22, 1978, Ser. No. 908,192
Int. Cl.[2] C07D *241/08;* A61K *31/495;* A01N *9/22*
U.S. Cl. 424—250 3 Claims

1. Piperazinium: 1,1,4-trimethyl-3-oxo-, methylsulfate and piperazinium: 1-(2,6-dichlorophenyl)methyl)-1,4-dimethyl-3-oxo-, bromide.

2. The method for the control and killing of mouse trichostrongylid, the method comprising adminstering to the mouse trichostrongylid a control and killing amount of piperazinium: 1,1,4-trimethyl-3-oxo-, methylsulfate.

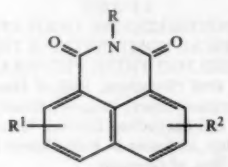
3. A method for the control and killing of beet army worm larvae, the method comprising administering to the larvae a control and killing amount of piperazinium: 1-(2,6-dichlorophenyl)methyl)-1,4-dimethyl-3-oxo-, bromide.

4,170,651
2-SUBSTITUTED-1H-BENZ-[de]-ISOQUINOLINE-1,3(2H)-DIONES

Peter C. Wade, Pennington, N.J., and Berthold R. Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 812,886, Jul. 5, 1977, Pat. No. 4,115,555, which is a division of Ser. No. 727,836, Sep. 9, 1976, Pat. No. 4,051,246. This application Jul. 12, 1978, Ser. No. 923,882
Int. Cl.[2] C07D *217/24;* A61K *31/47*
U.S. Cl. 424—258 6 Claims

1. A compound of the formula:



wherein R^1 and R^2 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, lower alkylthio, nitro, cyano, and trifluoromethyl; and R is cycloalkanol of 5 to 7 carbons.

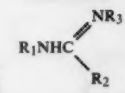
6. The method of treating inflammation in a mammalian specie comprising administering a composition containing a pharmaceutically acceptable carrier and as the active ingredient from about 1 mg./kg. to about 30 mg./kg. of a compound or mixture of compounds of claim 1.

4,170,652
HETEROCYCLIC-METHYLTHIOALKYL-GUANIDINES

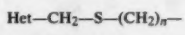
Graham J. Durant; Charon R. Ganellin, both of Welwyn Garden City, and Rodney C. Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, United Kingdom

Division of Ser. No. 794,178, May 5, 1977, Pat. No. 4,107,319, which is a division of Ser. No. 551,220, Feb. 19, 1975, Pat. No. 4,036,971. This application Apr. 17, 1978, Ser. No. 896,848
Claims priority, application United Kingdom, Mar. 12, 1974, 10869/74
Int. Cl.[2] C07D *213/53, 249/08;* A61K *31/44, 31/41*
U.S. Cl. 424—263 7 Claims

1. A compound of the formula:



wherein R_1 represents a grouping of the structure



wherein Het is a nitrogen containing 5 or 6 membered heterocyclic ring selected from pyridine and 1,2,4-triazole which is optionally monosubstituted by lower alkyl, hydroxyl, halogen or amino; n is 2 or 3; R_2 is NHR_5; R_3 is R_1; and R_5 is lower alkyl, or a pharmaceutically acceptable acid addition salt thereof.

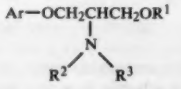
7. A method of blocking histamine H_2-receptors which comprises administering to an animal in need thereof, in an effective amount to block said receptors, a compound of claim 1.

4,170,653
ANTIDEPRESSANT NAPHTHYLOXY PIPERIDINO AND PYRROLIDINO PROPANOL ETHERS

Jean-Marie Ferland, St. Laurent; Real Laliberte, Chomedey; Wilbur Lippmann, Montreal, and Thomas A. Pugsley, Kirkland, all of Canada, assignors to Ayerst McKenna and Harrison Limited, Montreal, Canada

Division of Ser. No. 687,851, May 19, 1976, Pat. No. 4,060,613. This application Sep. 1, 1977, Ser. No. 829,769
Int. Cl.[2] A61K *31/445;* C07D *211/14*
U.S. Cl. 424—267 7 Claims

1. A compound of the formula 1



in which Ar is 1-naphthyl, R^1 is lower alkyl containing from one to six carbon atoms in a straight chain and three to four carbon atoms in a branched chain; and R^2 and R^3 together with the nitrogen atom to which they are joined from a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl and piperidino; or a therapeutically acceptable acid addition salt thereof.

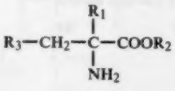
4,170,654
ANTIHYPERTENSIVE COMPOSITIONS CONTAINING N-HETEROCYCLICALANINES AND α-HYDRAZINOARYLPROPIONIC ACID/ESTER

Clement A. Stone, Blue Bell, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 850,755, Nov. 11, 1977, which is a division of Ser. No. 743,369, Nov. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 657,822, Feb. 13, 1976, abandoned. This application Jul. 6, 1978, Ser. No. 922,460
Int. Cl.[2] A61K *31/24, 31/35, 31/195*
U.S. Cl. 424—283 9 Claims

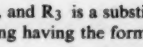
1. A pharmaceutical composition for treating hypertension comprising a therapeutically effective amount of

(A) a compound having the formula:



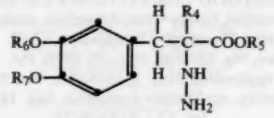
and pharmaceutically acceptable salts thereof, wherein R_1 and R_2 may be hydrogen or alkyl of from 1 to 4 carbon

atoms, and R_3 is a substituted or unsubstituted heterocyclic ring having the formula:



in which the heterocyclic ring is 5-hydroxy-4H-pyran-4-on-2-yl or the pharmaceutically acceptable salts thereof, and

(B) a decarboxylase inhibitor having the formula:



wherein R_4, R_5, R_6 and R_7 are independently selected from the group consisting of hydrogen and C_1–C_4 alkyl, and pharmaceutically acceptable salts thereof wherein the ratio of A:B is about 10:1 to 1:100.

4,170,655

STABLE AQUEOUS OR AQUEOUS-ALCOHOLIC SOLUTIONS OF FAT-SOLUBLE PERFUME OILS OR DRUGS CONTAINING HYDROXYALKYL ESTER- OR N-(HYDROXYALKYL) AMIDE-ETHOXYLATES

Ulrich Zeidler, and Fanny Scheuermann, both of Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

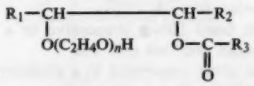
Filed Aug. 19, 1977, Ser. No. 826,044

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1976, 2639293

Int. Cl.[2] **A61K** *31/16, 31/20, 31/25, 31/355*

U.S. Cl. 424—284 **8 Claims**

1. Clear, stable, aqueous or aqueous-alcoholic solutions of a fat-soluble ethereal perfume oil or vitamin, consisting essentially of from 0.5% to 5% by weight, relative to the total weight of the solution, of a hydroxyalkyl ester-ethoxylate intermediary of the formula



wherein R_1 and R_2 independently of each other are a member selected from the group consisting of alkyl having 1 to 18 carbon atoms and hydrogen, R_3 is a member selected from the group consisting of alkyl having 1 to 5 carbon atoms and phenyl, and n is an integer from 6 to 40 with the proviso that the total of the carbon atoms of R_1+R_2 is from 6 to 20, from 0.1% to 1% by weight relative to the total weight of the solution of a fat-soluble ethereal perfume oil or fat-soluble vitamin, wherein the amount of said ester-ethoxylate intermediary is at least four times the amount of said perfume oil or vitamin, from 0 to 10% by weight of a water-miscible alcohol, and the remainder to 100% by weight of the conventional substances used in said solution including water where the amount of water or water and alcohol is from 70% to 99% by weight, relative to the total weight of the solution.

4,170,656

COMPOSITIONS CONTAINING CIS-2-BENZOYL-3-HYDROXY-CROTONONITRILE USED TO TREAT INFLAMMATION AND JOINT DETERIORATION

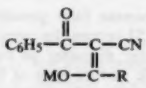
John W. Hanifin, Jr., Suffern, and David N. Ridge, Upper Grandview, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 801,899, May 31, 1977, abandoned. This application Mar. 31, 1978, Ser. No. 892,002

Int. Cl.[2] **A61K** *31/275*

U.S. Cl. 424—304 **3 Claims**

1. The method of inhibiting the progression of arthritis in a mammal which comprises administering to said mammal an effective amount of a compound selected from the group consisting of those of the formula:



wherein R is an alkyl group having from one to four carbon atoms and M is hydrogen or a pharmacologically acceptable cation, and the tautomers thereof.

4,170,657

SUBSTITUTED(((PHENYL)AMINO)CARBONYL)-BENZAMIDES

Raymond H. Rigterink, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 13, 1977, Ser. No. 796,645

Int. Cl.[2] **A01N** *9/12, 9/20;* **C07C** *127/17, 127/22*

U.S. Cl. 424—322 **31 Claims**

1. A compound selected from the group consisting of 2-chloro-N-(((4-(trifluoromethoxy)phenyl)amino)carbonyl)-benzamide, 2-trifluoromethyl-N-(((4-(trifluoromethoxy)phenyl-)amino)carbonyl)-benzamide, 2,6-difluoro-N-(((4-(1,1,2,2-tetrafluoroethoxy)phenyl)amino)carbonyl)-benzamide, 2,6-difluoro-N-(((4-(2,2-dichloro-1,1-difluoroethoxy)phenyl-)amino)carbonyl)-benzamide, 2,6-difluoro-N-(((4-(trifluoromethoxy)phenyl)amino)carbonyl)-benzamide, 2,6-dichloro-N-(((4-(trifluoromethoxy)phenyl)amino)carbonyl)-benzamide, 2,6-dimethoxy-N-(((4-(1,1,2,2-tetrafluoroethoxy)phenyl-)amino)carbonyl)-benzamide, 2,6-dichloro-N-(((2-(2,2-dichloro-1,1-difluoroethoxy)phenyl)amino)carbonyl)-benzamide, 2,6-dichloro-N-(((4-(2,2-dichloro-1,1-difluoroethoxy)-phenyl)amino)carbonyl)-N-methylbenzamide, 2-chloro-N-(4-(((2,2-dichloro-1,1-difluoroethylthio)phenyl)amino)carbonyl)-benzamide, 2,6-dichloro-N-(((4-((2,2-dichloro-1,1-difluoroethyl)thio)phenyl)amino)carbonyl)-benzamide, 2-chloro-N-(((2-(2,2-dichloro-1,1-difluoroethoxy)phenyl)amino)carbonyl)-benzamide, 2-chloro-N-(((4-(1,1,2,2-tetrafluoroethoxy)phenyl-)amino)carbonyl)-benzamide, 2,6-dibromo-N-(((4-(1,1,2,2-tetrafluoroethoxy)phenyl)amino)carbonyl)-benzamide, 2,6-dichloro-N-(((4-(2,2-dichloro-1,1-difluoroethoxy)phenyl)methylamino)carbonyl)-benzamide, 2,6-difluoro-N-(((4-(2,2-dichloro-1,1-difluoroethoxy)phenyl)methylamino)carbonyl)-benzamide, 2-bromo-N-(((4-(1,1,2,2-tetrafluoroethoxy)phenyl-)amino)carbonyl)-benzamide, 2,6-dichloro-N-(((3-(2,2-dichloro-1,1-difluoroethoxy)phenyl)amino)carbonyl)-benzamide, 2-chloro-N-(((4-(2,2-dichloro-1,1-difluoroethoxy)-phenyl)methylamino)carbonyl)-benzamide, 2,6-difluoro-N-(((3-(2,2-dichloro-1,1-difluoroethoxy)phenyl)amino)carbonyl)-benzamide, 2,6-difluoro-N-(((2-(2,2-dichloro-1,1-difluoroethoxy)phenyl)amino)carbonyl)-benzamide, 2-trifluoromethyl-N-(((4-(2,2-dichloro-1,1-difluoroethoxy)phenyl)methylamino)-carbonyl)-benzamide, 2-fluoro-N-(((4-(1,1,2,2-tetrafluoroethoxy)phenyl)amino)carbonyl)-benzamide, 2,6-difluoro-N-(((4-((2,2-dichloro-1,1-difluoroethyl)thio)phenyl)amino)carbonyl)-benzamide, 2,6-difluoro-N-(((4-((1,1,2,2-tetrafluoroethyl)thio)phenyl)amino)carbonyl)-benzamide, 2,6-dichloro-N-

(((4-((1,1,2,2-tetrafluoroethyl)thio)phenyl)amino)carbonyl)-benzamide, 2,6-dichloro-N-(((4-(2,2-dichloro-1,1-difluoroethoxy)phenyl)amino)carbonyl)-benzamide, 2,6-dichloro-N-(((4-(1,1,2,2-tetrafluoroethoxy)phenyl)amino)carbonyl)-benzamide and 2-chloro-N-(((4-(2,2-dichloro-1,1-difluoroethoxy)-phenyl)amino)carbonyl)-benzamide.

31. A composition for the control of insects comprising a suitable adjuvant and an insecticidally-effective amount of a compound of claim **1**.

4,170,658

CALCIUM CARBONATE FILLER

David L. Skinner, and Edward L. Moon, both of St. Petersburg, Fla., assignors to The Georgia Marble Company, Atlanta, Ga.

Filed Jan. 28, 1976, Ser. No. 653,232
Int. Cl.[2] C01F *5/24*; C09C *1/02*
U.S. Cl. 423—430 **3 Claims**

1. A calcium carbonate filler powder characterized by a porosity of less than 53 percent by pore volume analysis, by a Fisher Sub-Sieve Sizer diameter of between 2.60 and 2.90 microns, by a specific surface area of between 1.75 and 2.00 square meters per gram and by a particle size distribution as determined by a Sedigraph 5000 Analyzer as follows:

Cumulative Mass Percent finer than	Diameter Range (Microns, Micrometers)
100	20 – 22
95	17 – 18
90	15 – 17
85	14 – 16
80	13.5 – 15
75	13.0 – 14
70	12.0 – 13.5
65	11.5 – 13.3
60	11.0 – 13.0
55	10.0 – 12.5
50	9.8 – 12.0
45	9.0 – 11.5
40	8.0 – 10.5
35	6.8 – 10.0
30	5.1 – 8.0
25	5.0 – 5.8
20	2.5 – 3.5
15	1.7 – 2.2
10	1.0 – 1.2
5	0.55 – 0.65
2	0.35 – 0.40
0	0.20 – 0.20

4,170,659

FRIED DOUGH PRODUCT AND METHOD

Rose W. Totino; James R. Behnke, both of Minneapolis; Jack D. Westover, St. Paul, and Richard L. Keller, Minneapolis, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Jul. 18, 1977, Ser. No. 816,641
Int. Cl.[2] A23L *1/01*
U.S. Cl. 426—95 **21 Claims**

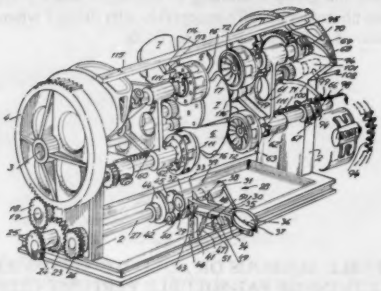
1. A process of preparing a fried dough shell comprising: providing a sheet of dough, piercing the dough sheet to provide a plurality of spaced-apart holes which extend all the way through the dough sheet from the top surface through the bottom surface; frying the dough sheet to form blisters therein and to cook the interior of the dough sheet to a moist, tender, bready consistency and form a surface crust thereon, the density of the crust being greater than the density of the cooked dough within the interior of the sheet; and engaging said dough sheet during said frying with a confining member which prevents said blisters from projecting beyond a maximum height, at least some of said holes being hardened by said frying to provide a rivet-like bond between upper and lower surfaces of the dough sheet which prevents delamination of said surfaces.

4,170,660

METHOD FOR PITTING PEACHES

Jesus A. Silvestrini, Godoy Cruz, Argentina, assignor to California Processing Machinery, San Ramon, Calif.

Division of Ser. No. 639,706, Dec. 11, 1975, Pat. No. 4,109,570.
This application May 1, 1978, Ser. No. 901,443
Claims priority, application Argentina, Aug. 14, 1975, 260021
Int. Cl.[2] A23N *4/22*
U.S. Cl. 426—485 **7 Claims**



1. Method for parting or bisecting and de-stoning fruit such as peaches comprising the steps of

receiving a fruit and producing a cut partially through its pulp thus defining two adhered pulp halves,

gripping the stone of the fruit,

rotating the partially cut fruit, gripped by its stone about a first axis spaced from said fruit,

resiliently gripping both halves of the fruit pulp by engaging the outer surface of each half with a flexible diaphragm which is deformed into gripping engagement by the application of compressed fluid thereagainst;

rotating the resiliently engaged halves in opposite directions about a center axis extending through both said fruit halves during a predetermined rotation about said first axis until the freeing of both halves, one with respect to the other, and of both halves from the stone, while the stone remains gripped,

releasing the freed halves responsive to a predetermined rotation about said first axis, and

releasing the stone responsive to a predetermined rotation about said first axis.

7. A method for parting or bisecting and de-stoning fruit such as peaches comprising the steps of

receiving a fruit and producing a cut partially through its pulp to define two adhered pulp halves,

gripping the stone of the fruit,

resiliently gripping both pulp halves of the fruit by engaging the outer surface of each half with a flexible diaphragm deformed by the application of compressed fluid thereagainst,

rotating the resiliently engaged halves in opposite directions about a center axis extending through both said fruit halves until the freeing of both halves, one with respect to the other, and of both halves from the stone while the stone remains gripped,

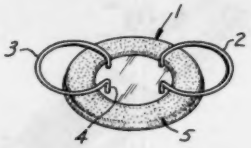
releasing the freed halves from said resilient gripping, and

releasing the stone.

4,170,661
METHOD OF TREATING INTRAOCULAR LENS AND THE LIKE

Patricia M. Knight, Costa Mesa, and William J. Link, Irvine, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Nov. 30, 1977, Ser. No. 855,962
Int. Cl.[2] A61F *9/00*; B05D *3/00, 1/18*
U.S. Cl. 427—2 **23 Claims**



1. A method of precoating a device having a surface likely to contact a corneal endothelium during ophthalmic surgery, comprising the steps of:

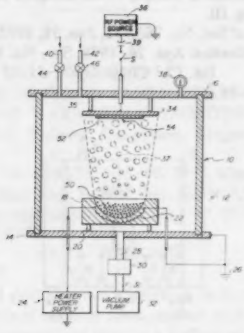
(a) coating such surface with a liquid media containing a water-soluble adherent film forming biocompatible material; and

(b) removing the liquid media from the surface to provide a substantially dry water-soluble film on the surface.

4,170,662
PLASMA PLATING

Armin K. Weiss, and John R. Clarke, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 688,663, May 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 636,394, Dec. 1, 1975, abandoned, which is a continuation-in-part of Ser. No. 521,011, Nov. 5, 1974, abandoned. This application Jan. 23, 1978, Ser. No. 871,314
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—38 **8 Claims**



1. A method for forming on the surface of a substrate a dense, photoconductive layer of stoichiometrically balanced lead oxide, said method comprising the steps of:

(a) disposing the substrate in an atmosphere of a gas comprising a mixture of oxygen and an inert gas;

(b) establishing an RF electric field in the vicinity of the substrate surface to produce a plasma of the gas in the vicinity of the substrate surface, such plasma comprising a mixture of positively charged gas ions and electrons;

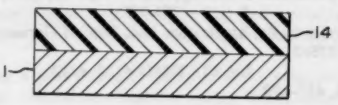
(c) electrically biasing the substrate to cause the positively charged gas ions to bombard the substrate surface; and

(d) depositing on the substrate surface a vapor of lead oxide while the surface undergoes bombardment by said gas ions.

4,170,663
METHOD FOR PRODUCING COATINGS OF LOW GLOSS

Ernest A. Hahn, Paris, France; Gary F. Murphy, deceased, late of Naperville, Ill. (by Mary Lou Murphy, administratrix), and Gerald J. Bruckbauer, Temple, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 13, 1978, Ser. No. 886,306
Int. Cl.[2] B05D *3/06*; C08G *63/02*
U.S. Cl. 427—44 **26 Claims**



1. A method of producing a hard, mar resistant and abrasion resistant, cured coating of low gloss comprising:

a. exposing a coating of radiation curable coating composition comprising:

(1) an oxygen inhibitable, radiation curable organic material having a plurality of sites of ethylenic unsaturation, and

(2) an ultraviolet light absorbing pigment

to ionizing radiation in an atmosphere containing a low gloss imparting amount of oxygen to cure the interior of said coating to a greater degree of cure than a surface layer of said coating;

b. exposing said coating which has been exposed to ionizing radiation to ultraviolet light in an atmosphere wherein any oxygen present is insufficient to significantly inhibit free radical curing of the exterior portion of said surface layer to cure said exterior portion of said surface layer to a greater degree of cure than the interior portion of said surface layer;

exposing said coating which has been exposed to ionizing radiation and ultraviolet light to ionizing radiation to cure said interior portion of said surface layer.

4,170,664
RESILIENT RADIATION-CURABLE AUTOMOTIVE BODY COMPONENTS

Lawrence Spenadel, Westfield, and S. Alexander Banks, Cranford, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 13, 1978, Ser. No. 924,360
Int. Cl.[2] C08F *8/00, 18/00*
U.S. Cl. 427—44 **39 Claims**

1. A process for the production of cross-linked automotive body components having a cured surface coating comprises:

(a) fabricating an uncross-linked component from a composition comprising a uniform mixture of one or more elastomeric interpolymers comprising ethylene and propylene, one or more thermoplastic homopolymers of a C_2 to C_6 alpha-olefin, and one or more multifunctional vinylic or allylic monomers;

(b) applying a radiation-curable surface coating to said component, and

(c) simultaneously curing the surface coating and cross-linking the component composition by irradiating the coated component with high-energy ionizing radiation.

4,170,665
METHOD OF MAKING IMPREGNATED ELECTRICAL CAPACITOR EMPLOYING PLASTIC FOIL DIELECTRIC

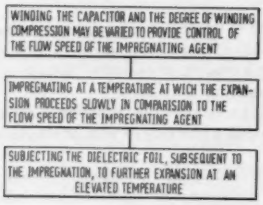
Reinhard Behn; Josef Lauber; Karl-Heinz Preibinger, all of Munich, and Hans-Heinz Rheindorf, Heidenheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 650,621, Jan. 20, 1976, abandoned, which is a continuation of Ser. No. 308,022, Nov. 27, 1972, abandoned, which is a continuation of Ser. No. 856,220, Sep. 8, 1969, abandoned, which is a continuation of Ser. No. 689,493, Dec. 11, 1967, abandoned. This application Apr. 21, 1977, Ser. No. 789,445

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1966, 107565

Int. Cl.[2] H01G *4/22, 4/32*

U.S. Cl. 427—79 **6 Claims**


WINDING THE CAPACITOR AND THE DEGREE OF WINDING COMPRESSION MAY BE VARIED TO PROVIDE CONTROL OF THE FLOW SPEED OF THE IMPREGNATING AGENT
IMPREGNATING AT A TEMPERATURE AT WICH THE EXPANSION PROCEEDS SLOWLY IN COMPARISION TO THE FLOW SPEED OF THE IMPREGNATING AGENT
SUBJECTING THE DIELECTRIC FOIL, SUBSEQUENT TO THE IMPREGNATION, TO FURTHER EXPANSION AT AN ELEVATED TEMPERATURE

1. A process for producing an electric, impregnated ac capacitor where the ac capacitor has a dielectric formed of a wound synthetic polypropylene film and electrodes formed of paper bands metallized on both sides such that the paper bands reside in the field-free space between the metallized surfaces thereof, comprising the steps of winding the dielectric and metallized paper bands with a predetermined tension so that the space lying between the surface of the dielectric when impregnated and the adjacent metallized surface is predetermined to be of sufficient volume to be completely filled by an anticipated swelling of the dielectric film, completely impregnating the capacitor at a first temperature, carrying out said impregnation with an insulating oil which contains hydrogen-binding aromatic fractions as well as naphthene and paraffin fractions, subsequently, following complete impregnation, treating the capacitor at a second elevated temperature which is effective for producing a swelling of the dielectric film in an amount which causes the swelled film to occupy the entire space previously occupied between the surface of the unswelled film and the adjacent metallized surface such that the resulting dielectric is practically free of oil or air gaps.

4,170,666
METHOD FOR REDUCING SURFACE RECOMBINATION VELOCITIES IN III-V COMPOUND SEMICONDUCTORS

Ranjeet K. Pancholy, Mission Viejo; Gordon J. Kuhlmann, Newport Beach, and D. Howard Phillips, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 11, 1977, Ser. No. 796,118

Int. Cl.[2] B05D *5/12*

U.S. Cl. 427—82 **4 Claims**

1. A method of making a semiconductor device wherein the surface recombination velocity is substantially reduced, comprising the steps of:

providing a wafer of semiconductor material having uniform composition,

said wafer of semiconductor material is formed of a compound comprising III-V materials,

forming a surface layer at one surface of said wafer by adding a nutrient element to change the chemical composition of said wafer in the vicinity of said one surface thereby to form an increased energy band gap adjacent said one surface of said wafer,

said forming step is conducted by ion implantation such that said surface layer is formed as an integral part of said wafer, and

converting only a portion of said surface layer to form a native passivation dielectric at said one surface of said wafer,

said converting step is an oxidation process wherein only a portion of said surface layer is consumed during the converting step.

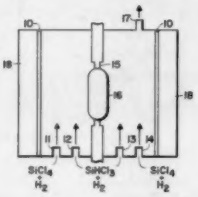
4,170,667
PROCESS FOR MANUFACTURING PURE POLYCRYSTALLINE SILICON

Michael A. Rodgers, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 763,952, Jan. 31, 1977, abandoned. This application Apr. 24, 1978, Ser. No. 899,125

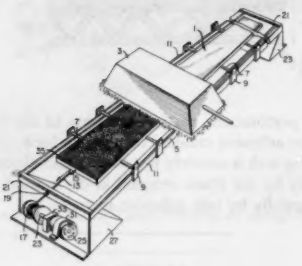
Int. Cl.[2] C01B *33/00, 33/02*

U.S. Cl. 427—86 **3 Claims**



1. A process for producing pure semiconductor grade polycrystalline silicon in a reaction chamber having insulated walls comprising the steps of: introducing about 7 to 8.2 mole percent trichlorosilane in hydrogen into said reaction chamber through inlets located near the center of said chamber; introducing about 12 to 13 mole percent silicon tetrachloride in hydrogen into said reaction chamber through inlets located in close proximity to said insulated walls of said reaction chamber; mixing said silicon tetrachloride and trichlorosilane in hydrogen within said reaction chamber; reacting said mixture of silicon tetrachloride and trichlorosilane in hydrogen at a temperature between 900° C. and 1200° C. to form silicon; and depositing said silicon on a filament within said reaction chamber.

4,170,668
METHOD FOR WOOD PRECHARRING
Calvin K. Lee, and Robert F. Chaiken, both of Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.
Filed Sep. 15, 1978, Ser. No. 942,851
Int. Cl.[2] B05D *3/08, 3/02*
U.S. Cl. 427—223 6 Claims



1. A method of treating the surface of wood to increase its resistance to fire and rot comprising the steps of:
(1) positioning the wood whose surface is to be treated so that it is spaced a given distance from a source of radiant heat energy which source is capable of emitting at least 0.5 calories per centimeter per second of energy as measured at the to be treated wood's surface;
(2) using the radiant heat energy source to char the wood's surface to be treated to a non-flaming uniform depth layer throughout the surface facing the source to at least 3 millimeters; and
(3) moving the wood relative to the source of radiant heat so as to allow charring of the wood's surface to a discrete depth of at least 3 millimeters but prevent gaseous flaming combustion thereof.

4,170,669
METHOD FOR MARKING FABRIC WITH ERASABLE COLOR MARKING COMPOSITION
Ichiro Okada, 7-1, 1-chome Oakayama, Meguro-ku, Tokyo, Japan
Division of Ser. No. 633,177, Nov. 19, 1975, abandoned. This application Aug. 5, 1977, Ser. No. 822,207
Claims priority, application Japan, Nov. 25, 1974, 49-134319; Jan. 11, 1975, 50-5297
Int. Cl.[2] B05D *3/10*
U.S. Cl. 427—275 10 Claims

1. A method of putting a color mark on each of piled fabric pieces, which mark is erasable upon contact with an appropriate acid or base, comprising passing a hollow needle through piled fabric pieces, and, during piercing of the needle into or out of the fabric pieces, ejecting from the needle a marking composition, said composition comprising a water dispersion of a heat-resistant inorganic pigment in an amount sufficient to provide the color mark on each fabric piece, said pigment being soluble in acid and/or base and substantially insoluble in water, an anti-settling agent in an amount sufficient to maintain the pigment dispersed in water; a water-miscrible water volatilization retardant in an amount sufficient to make the evaporation rate of the dispersion lower than that of water; and a water-miscible penetrant having the property of lowering the surface tension of water in said amount sufficient to improve the penetrability of the composition to the fabric piece; and then erasing the mark with an appropriate acid or base.

4,170,670
FORMULATIONS FOR IMPARTING FLAME RETARDANCE TO CELLULOSIC FABRICS VIA TRANSFER TECHNIQUES
Robert J. Harper, Jr.; Timothy A. Calamari, Jr., and Sidney P. Schreiber, all of Metairie, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Continuation-in-part of Ser. No. 555,486, Mar. 5, 1975. This application Dec. 30, 1977, Ser. No. 866,078
Int. Cl.[2] B05D *3/10*
U.S. Cl. 427—341 8 Claims

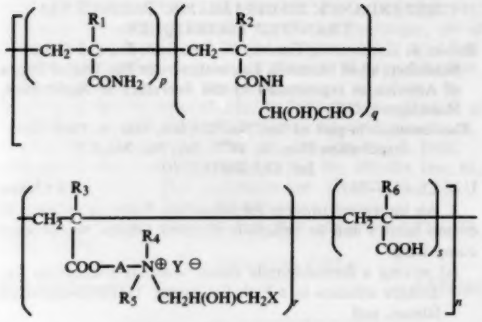
1. An improved process for imparting flame retardance to cotton fabrics and to cellulosic blended fabrics, the process comprising:
(a) mixing a formaldehyde donor with an ammonium hydroxide solution in a bath for curing THPOH-sensitized fabrics, and
(b) applying a limited amount of the solution to the sensitized fabric by transfer padding techniques.

4,170,671
METHOD FOR TREATMENT OF METAL SURFACE
Youji Hirasawa, Hirakata, and Hisataka Yamamoto, Tokyo, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan
Continuation of Ser. No. 793,352, May 3, 1977, abandoned. This application Aug. 11, 1978, Ser. No. 933,042
Int. Cl.[2] B05D *1/18, 3/02*
U.S. Cl. 427—388 C 14 Claims

1. A method for the treatment of a metal surface for the purpose of preparing it to receive a coating finish, which comprises applying a treating liquid consisting essentially of an emulsion and a water-soluble chromium compound containing 30 to 90% by weight of hexavalent chromium to a metal surface and drying the resultant, said treating liquid containing substantially no alkali metal ion, said emulsion being prepared by emulsion-polymerizing an α,β-monoethylenically unsaturated monomer selected from the group consisting of an acrylic ester, a methacrylic ester, acrylonitrile, methacrylonitrile and styrene in the presence of a polymer selected from the group consisting of a polyacrylic acid and a copolymer of acrylic acid and a monomer selected from the group consisting of methacrylic acid, acrylamide, N-methylolacrylamide, methacrylamide, N-methylolmethacrylamide, 2-hydroxyethyl acrylate, hydroxypropyl acrylate, 2-hydroxyethylmethacrylate, hydroxypropyl methacrylate, 3-hydroxybutylacrylate, 2,2-bis(hydroxymethyl)ethyl acrylate, 2,3-dihydroxypropyl methacrylate, 3-hydroxybutyl methacrylate, and mono(2-hydroxyethyl methacrylate) acid phosphate, said polymer being used in an amount of 20 parts by weight or more in respect to the solid content, 100 parts by weight of the α,β-monoethylenically unsaturated monomer.

4,170,672
PROCESS FOR COATING PAPER WITH A WATER SOLUBLE THERMOSETTING RESIN
Koichi Moriya, Shibukawa, and Iwao Honda, Maebashi, both of Japan, assignors to The Japan Carlit Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 833,048, Sep. 14, 1977, Pat. No. 4,122,071. This application Aug. 9, 1978, Ser. No. 932,411
Claims priority, application Japan, Sep. 17, 1976, 51-110745
Int. Cl.[2] B32B *27/36;* D21H *1/28;* C08B *11/00;* C08F *220/56*
U.S. Cl. 427—391 9 Claims

1. A process for coating paper to impart both wet and dry strength which comprises coating paper with an aqueous solution having a pH of 3 to 10 of a water-soluble thermosetting resin of the formula



wherein:

R_1, R_2, R_3 and R_6 are independently selected from the group consisting of hydrogen and a methyl group,

both R_4 and R_5 are alkyl groups having 1 to 3 carbon atoms,

A is an alkylene group having 2 to 6 carbon atoms,

X is selected from the group consisting of chlorine, bromine and iodine,

Y is an anion selected from the group consisting of nitrate ion, chloride ion, sulfate ion and phosphate ion,

p, q, r and s are molar ratios of the recurring units arranged linearly and are the whole numbers having the relation of $q/(p+q)=0.1$–1.0, $r/(p+q+r+s)=0.001$–0.1 and $s/r=0$–2.0, and

n is a number of about 100 to 1000.

4,170,673

METHOD FOR PULLING CABLE

Allen C. Conti, 5294 E. 117th St., Garfield Heights, Ohio 44125

Continuation-in-part of Ser. No. 839,077, Oct. 3, 1977, Pat. No. 4,111,820. This application Apr. 13, 1978, Ser. No. 896,105

Int. Cl.[2] **B05D** *1/00, 3/00*

U.S. Cl. 427—401 **3 Claims**

1. A method for pulling cable having a protective sheathing of polyethylene or polyurethane through a conduit, duct or the like, said method including the steps of:

coating the outer surface of said protective sheathing with a non-degrading lubricant solution consisting essentially of about 0.5% to 50% by volume polyethylene oxide and about 6% to 30% by volume a dispersion agent selected from the group consisting of propylene glycol, glycerol, ethylene glycol, polypropylene glycol, diethylene glycol, triethylene glycol, and hexylene glycol, the ratio of the volume of polyethylene oxide to the volume of said dispersion agent being about 1:3, and the remainder being water; and

drawing said cable along a conduit while the lubricant remains on the outer surface of said protective sheathing.

4,170,674

COMPOSITE BOARD STRUCTURE USING A CORRUGATED FIBERBOARD AND A METHOD OF AND AN APPARATUS FOR PRODUCING THE COMPOSITE BOARD STRUCTURE

Masamitsu Matsuki, Sagamihara, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

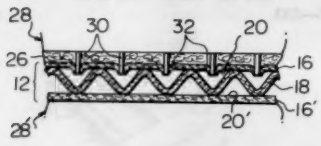
Filed Jul. 20, 1977, Ser. No. 817,445

Claims priority, application Japan, Jul. 21, 1976, 51-87069

Int. Cl.[2] **B32B** *3/28, 3/10*

U.S. Cl. 428—90 **6 Claims**

1. A composite board structure comprising a corrugated fiberboard having at least one liner and at least one corrugated paper medium which is bonded at the tops of its ridges to one face of the liner by means of a layer of a thermoplastic adhesive material, and a facing web of a fibrous fabric securely attached to the other face of said liner without an intervening adhesive layer, wherein the liner is formed with a plurality of perforations and the fibers of the fibrous fabric forming said facing web are partially stuffed into said perforations, the fibers in



each of the perforations partially sticking to the layer of the thermoplastic adhesive material on said one face of the liner so that the facing web is securely fastened to said other face of the liner partially by the fibers retained in the individual perforations and partially by said adhesive material.

4,170,675

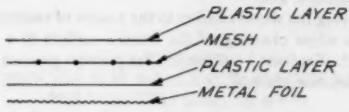
REINFORCED FLEXIBLE PANELS COMPRISING PLASTIC SHEETING ON OPPOSED SIDES OF A MESH LAYER AND A METAL FOIL LAYER IN ASSOCIATION WITH A PLASTIC SHEET LAYER

Michael Greengrass, Norwich, England, assignor to Flexipane Limited, England

Continuation-in-part of Ser. No. 792,803, May 2, 1977, Pat. No. 4,096,304. This application Jun. 9, 1978, Ser. No. 914,278

Int. Cl.[2] **B32B** *3/24, 5/02, 15/08, 27/08*

U.S. Cl. 428—109 **7 Claims**



1. A fire resistant and environmental containment sheet comprising, in combination:

at least four layers including opposed layers of plastic material on opposite sides of a mesh, said mesh having a plurality of openings, the plastic layers being fused together through said openings to encapsulate the mesh, one of said plastic layers also including a metal foil fused to the other side.

4,170,676

PROCESS, APPARATUS AND RESULTING THREE-LAYER NEEDLED NONWOVEN FABRIC

James H. Thomas, Swannanoa, N.C., assignor to National Distillers & Chemical Corporation, New York, N.Y.

Filed Mar. 22, 1978, Ser. No. 888,949

Int. Cl.[2] **B32B** *5/12*

U.S. Cl. 428—113 **32 Claims**

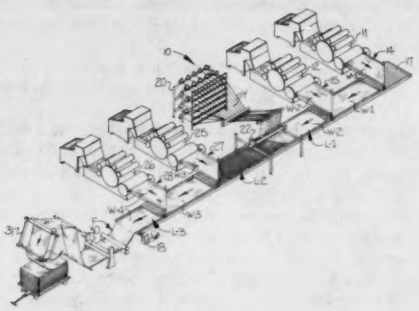
1. A needled nonwoven fabric adaptable for use as blankets or the like, said fabric being of elongate indeterminate length and of predetermined width and comprising:

a bottom outer layer of carded textile fibers oriented in the lengthwise direction of the fabric for producing strength and stability in the lengthwise direction;

a reinforcing middle layer constructed for providing strength and stability to the fabric in the widthwise direction;

a top outer layer of carded textile fibers oriented in the lengthwise direction of the fabric for producing strength and stability in the lengthwise direction; and

a multiplicity of needled fiber entanglements extending through said layers for interlocking the fibers of said



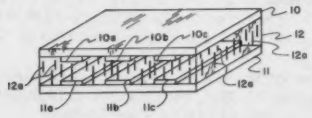
layers with each other and forming an integrated needled nonwoven fabric.

4,170,677

ANISOTROPIC RESISTANCE BONDING TECHNIQUE

Edward T. Hutcheson, Stafford, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 16, 1977, Ser. No. 852,113
Int. Cl.[2] B29C *19/06*
U.S. Cl. 428—119 **9 Claims**



1. A method of making electrical connections between two surfaces, wherein each surface has conductive areas and insulating areas including the the steps of:

(a) coating one surface with a plastic adhesive charged with paramagnetic conductive whiskers;

(b) placing the other surface on said coating;

(c) applying an aligning electric field to said coating to cause said whiskers to align perpendicular to said surfaces; and

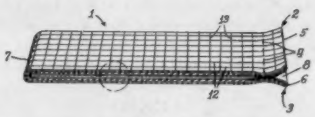
(d) hardening said adhesive while said field is applied.

4,170,678

MULTIPLE USE ARTICLE FOR CONDITIONING FABRICS IN A CLOTHES DRYER

Allen D. Urfer, Naperville, and Frank H. Stevens, Saint Charles, both of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Aug. 30, 1978, Ser. No. 938,179
Int. Cl.[2] G01M *1/00*
U.S. Cl. 428—124 **9 Claims**



1. A multiple-use fabric conditioner article for conditioning clothes in a washer or dryer comprising a substrate, a fabric conditioner coated on both surfaces of said substrate, said fabric softener having a softening point in the range of 100° F. to 170° F., and being selected from the group consisting of: cationic quaternary ammonium salts and imidazolinium salts; nonionic compounds, such as tertiary phosphine oxides, tertiary amine oxides, ethoxylated alcohols and alkyl phenols, and ethoxylated amines; anionic soaps, sulfates and sulfonates, including fatty acid soaps, ethoxylated alcohol sulfates, sodium alkyl sulfates, alkyl sulfonates, sodium alkylbenzenesulfonates, and sodium or potassium alkyl glyceryl ether sulfonates; amphoteric tertiary ammonium compounds; Zwitterionic quaternary ammonium compounds; and compatible mixtures of one or more compounds of these classes; said substrate being a water-laid or air-laid non-woven material comprising both natural and synthetic fibers, and having a greater concentration of an adhesive binder at one surface, said fabric conditioner-coated substrate being initially folded and secured loosely by an adhesive seam adjacent to the free ends thereof to expose only the adhesive-bonded surface carrying fabric conditioner, the adhesive seam adjacent the ends being rupturable, whereby the fabric conditioner article can unfold and thereby also expose the second surface of the article to transfer additional fabric conditioner during additional tumbling of said fabric conditioner article with additional clothes to be conditioned.

4,170,679

Patent Not Issued For This Number

4,170,680

NON-WOVEN FABRICS

David C. Cumbers, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 568,836, Apr. 17, 1975, Pat. No. 4,088,726. This application Feb. 28, 1978, Ser. No. 882,153
Claims priority, application United Kingdom, Apr. 26, 1974, 18369/74; Sep. 20, 1974, 41066/74; Feb. 7, 1975, 5282/75
Int. Cl.[2] B32B *3/00;* **D04H** *5/06, 3/14, 1/54*
U.S. Cl. 428—195 **8 Claims**

1. A non-woven fabric comprising a web of fibres which includes distributed thermoplastic material and which has been passed through a calender, said fabric, having on each face patterns of bonded areas at least some of which in one face overlap bonded areas on the opposite face, the material of the web between opposed portions of bonded areas being depressed and formed into coherent bonds, the coherently bonded areas varying in shape and area and together forming

a pattern of bonded areas the centroids of area of those bonded areas immediately adjacent any imaginary straight line across the fabric differing in their distances therefrom, and the bonded areas on at least one face being discrete discontinuous areas distributed over this face, the fibres in the bonded areas being bonded by softening and resolidification of the thermoplastic material.

4,170,681

METHOD OF APPLYING A VARNISH LAYER TO A PRINTED SURFACE AND PRODUCT MADE THEREBY

John R. Edwards, Chester; George K. Rennie, Wirral; David A. Rosser, Wirral, and Colin Smart, Wirral, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 20, 1978, Ser. No. 871,037
Claims priority, application United Kingdom, Jan. 21, 1977, 2549/77
Int. Cl.[2] B32B *3/10*
U.S. Cl. 428—205 **14 Claims**

1. A method of forming a varnish layer on a hydrophilic surface carrying at least one area of hydrophobic ink, comprising: applying to at least the inked portions of said surface a layer of an aqueous dispersion having a viscosity from about 25

to about 500 cps and containing from about 5% to about 60% by weight of a film forming copolymer or polymer, substantially insoluble in water at neutral pH, formed from a vinyl ester and/or acrylic ester, said dispersion further containing from about 0.5% to about 10% of an auxiliary film forming material capable of raising the critical surface tension of the hydrophobic ink area when coated thereon; and allowing said applied layer to dry.

4,170,682

TREATMENT OF NYLON FABRIC FOR WETTABILITY AND PRODUCT THEREOF

Robert E. Beetschen; Basil P. Lynch, both of Spencer, and Allie A. Short, Reedy, all of W. Va., assignors to Kellwood Company, St. Louis, Mo.

Filed May 18, 1977, Ser. No. 797,995
Int. Cl.[2] D06M *15/12*
U.S. Cl. 428—267 **15 Claims**

1. The method of treating nylon fabric for wettability, with the treated fabric washable in typical home laundering manner for a substantial number of launderings without undue loss of wettability comprising agitating the fabric in a bath comprising a wettability treatment agent in water, said agent comprising a condensation product of ethylene oxide with an aliphatic primary amine having between about 16 and about 18 carbon atoms in a ratio of about 16 moles ethylene oxide per mole of said primary amine, quaternized with methyl sulfate, the bath being at a temperature of from about 110° F. to 130° F., the agitation being such as to cause relative flow of the bath through the fabric from opposite sides of the fabric, the amount of said agent in the bath and the agitation being such as to cause exhaustion of said agent in amount from at least about 0.35% to about 1.40% by weight of the fabric onto the fabric from the bath with said agent dispersed substantially uniformly throughout the fabric.

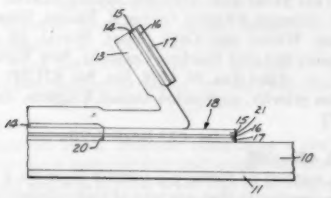
14. Nylon fabric treated with a wettability treatment agent comprising a condensation product of ethylene oxide with an aliphatic primary amine having between about 16 and about 18 carbon atoms in a ratio of 16 moles ethylene oxide per mole of said primary amine, quaternized with methyl sulfate in accordance with claim 1, the fabric being wettable to the extent that a one inch by six inch specimen will wick at least about 2¾ inches of water in three minutes, a ten inch by two inch specimen will saturate in less than four minutes, a ten inch by two inch specimen will transfer one hundred cc. of water in less than thirty-five minutes, a one-half inch by one-half inch specimen will saturate substantially instantly when dropped in water, and a drop of water dropped onto the fabric loses its specular reflective power substantially instantly, and said fabric retaining said wettability for at least about thirty-five launderings of the home laundering type.

4,170,683

REFLECTIVE SENSE MARKER FOR MAGNETIC RECORDING TAPE

Richard L. Miklos, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 15, 1978, Ser. No. 878,079
Int. Cl.[2] H01F *10/00*
U.S. Cl. 428—336 **7 Claims**



1. Magnetic recording tape having firmly adhered to its back side a reflective sense marker which has a thickness not greater than 2.5 micrometers and acts as if it has zero thickness in that when the tape is wound upon itself in roll form, the sense marker produces essentially no permanent plastic deformation in overlying convolutions of the tape, said sense marker comprising

(a) a thin-film metal coating having at least 90% reflectivity at an incident angle of 45° and a maximum thickness of 1000 A,

(b) a layer of heat-activated adhesive which has a thickness of 0.2–1.5 micrometers, will not soften at 55° C., and bonds the thin-film coating to the back side of the tape, and

(c) a tough, abrasion-resistant, transparent polymeric protective layer which covers the thin-film coating, has a thickness of 0.2–1.5 micrometers and will not transfer to the overlying convolution of the tape when the tape is stored in roll form at 52° C. and 85% relative humidity for 18 hours followed by 38° C. and 0–10% relative humidity for 4 hours.

4,170,684

CONDUCTORS HAVING INSULATION OF POLYESTER IMIDE RESIN

Karl Schmidt; Ferdinand Hansch; Hans-Malte Rombrecht, and Hans-Joachim Beck, all of Hamburg, Fed. Rep. of Germany, assignors to Dr. Beck & Co. A.G., Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 293,878, Oct. 2, 1972, abandoned, which is a division of Ser. No. 659,234, Aug. 8, 1967, Pat. No. 3,697,471, which is a continuation of Ser. No. 238,315, Nov. 2, 1962, abandoned. This application Apr. 15, 1976, Ser. No. 677,207

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1961, 12686; Dec. 12, 1961, 1445263; Jul. 6, 1962, 1495100
Int. Cl.[2] H01B *3/42, 19/04*
U.S. Cl. 428—379 **55 Claims**

1. Method of coating wire with electrically insulating enamel which comprises passing the wire through an enameling lacquer comprising a resin for forming the enamel and a cresol type solvent, to coat the wire with a film of the enameling lacquer, and thereafter heating the coated wire to cure the resin and drive off the solvent, said resin being a polyester imide resin having ester groups of acid and alcohol moieties in the chain which are condensation products of at least difunctional carboxylic acid or a derivative thereof which is a functionally active equivalent, and at least difunctional alcohol or a derivative thereof which is a functionally active equivalent, and, between said ester groups, an amount effective to improve the thermal stability of the resin without rendering the resin insoluble to the extent which would make it unsuitable for use in a wire lacquer composed of the resin dissolved in cresol and solvent naphtha, of moieties containing a 5-membered imide ring and which are condensation products of an aromatic carboxylic acid anhydride containing a 5-membered cyclic carboxylic acid anhydride group or a derivative thereof which is a functionally active equivalent and at least one additional reactable group, and a primary aromatic amine or a derivative thereof which is a functionally active equivalent, containing at least one additional reactable group.

4,170,685

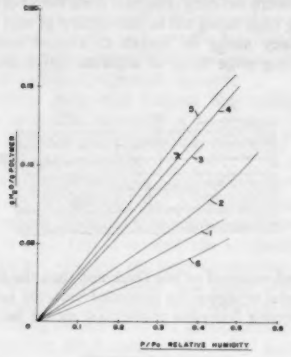
POLYVINYL PYRIDINE MICROSPHERES

Alan Rembaum, Altadena; Amitava Gupta, Los Angeles, and Willi Volksen, Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 671,058, Mar. 29, 1976, abandoned. This application Mar. 22, 1977, Ser. No. 780,007
Int. Cl.[2] B32B *5/16;* **C08J** *9/00;* **C08F** *8/00, 2/46*
U.S. Cl. 428—402 **4 Claims**

1. A composition consisting essentially of discrete beads, at least 80% of which have a uniform diameter from 100 A to 60 microns having a surface area of at least 1 m^2/g and consisting

essentially of addition copolymerized monomer mixture containing 60 to 80% vinyl pyridine, 10 to 30% of an addition



copolymerizable, water soluble, monounsaturated comonomer selected from acrylamide, methacrylamide, acrylic acid, methacrylic acid or compounds of the formula:

$$R^1-\overset{CH_2}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-R^2-Z$$

where R^1 is hydrogen or lower alkyl of 1–8 carbon atoms; R^2 is alkylene of 1–12 carbon atoms and Z is —OH or

$$R^3-\overset{|}{N}-R^4$$

where R^3 or R^4 are individually selected from H, lower alkyl or lower alkoxy of 1–8 carbon atoms, and 5 to 30% of a water soluble, addition copolymerizable polyvinyl cross-linking agent said beads including a hard, cross-linked, hydrophobic vinyl pyridine copolymeric core and a hydrophilic, monounsaturated comonomer copolymeric sheath.

4,170,686

SUBSTRATES AND ARTICLES OF MANUFACTURE INCORPORATING A FLUOROPOLYMER PRIMER COATING

William A. Miller, Bridgewater; John P. Opsasnick, Edison, and William A. Miller, Parsippany, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 704,158, Jul. 12, 1976, Pat. No. 4,098,756. This application Mar. 2, 1978, Ser. No. 882,718

Int. Cl.[2] B32B *15/08, 27/30*

U.S. Cl. 428—416 **12 Claims**

1. A substrate coated with a composition comprising a copolymer of ethylene, chlorotrifluoroethylene and 0 to 10 mol percent of an additional monomer selected from the group consisting of 3,3,3-trifluoro-2-trifluoromethyl propene, a vinyl monomer which is free of telogenic activity and which provides a side chain having at least two carbon atoms, said side chain being aromatic or having its elements bonded together by a single bond only, or mixtures thereof, and containing from about 5 to 60 percent by weight of the composition of an epoxy resin and about 1 to 25 percent by weight of the composition of an oxide of cobalt, nickel, manganese, tungsten and mixtures thereof.

3. An article of manufacture which comprises a substrate, a primer coating fused thereon and comprising a copolymer of ethylene, a halogenated comonomer selected from the group consisting of tetrafluoroethylene, chlorotrifluoroethylene and mixtures thereof and 0 to 10 mol percent of an additional monomer selected from the group consisting of 3,3,3-trifluoro-2-trifluoromethyl propene, a vinyl monomer which is free of telogenic activity and which provides a side chain having at least two carbon atoms, said side chain being aromatic or having its elements bonded together by a single bond only, or mixtures thereof, and containing from about 5 to 60 percent by weight of the composition of an epoxy resin and from about 1 to 50 percent by weight of the composition of an oxide of cobalt, nickel, manganese, tungsten or mixtures thereof, and an outer coating fused to said primer coating and comprising a copolymer of ethylene, a halogenated comonomer selected from the group consisting of tetrafluoroethylene, chlorotrifluoroethylene and mixtures thereof and 0 to 10 mol percent of an additional monomer selected from the group consisting of 3,3,3-trifluoro-2-trifluoromethyl propene, a vinyl monomer which is free of telogenic activity and which provides a side chain having at least two carbon atoms, said side chain being aromatic or having its elements bonded together by a single bond only, or mixtures thereof.

4,170,687

PLANOGRAPHIC PRINTING PLATE FOR DRY PRINTING

Leonard A. Spicer, Ilford; Derek J. McGee, Henham, and Ian H. Elson, Northwich, all of England, assignors to Gestetner Limited, London, England

Filed Sep. 29, 1977, Ser. No. 837,864

Claims priority, application United Kingdom, Sep. 30, 1976, 40685/76; Dec. 22, 1976, 53570/76

Int. Cl.[2] B32B *27/00, 27/40;* **B41N** *1/00;* **G03F** *7/02*

U.S. Cl. 428—421 **13 Claims**

1. A planographic printing plate comprising a support sheet having an ink-repellent coating containing 0.5 to 15%, by weight of the said coating, of a fluorinated polyurethane obtained by reaction of a fluorinated polyol and a non-fluorinated polyol with a polyisocyanate, and the balance to 100% of a non-fluorinated film-forming synthetic resinous material.

4,170,688

PROCESS FOR BONDING AN IMPROVED METALLIC SUPPORT MEMBER TO GLASS SURFACES

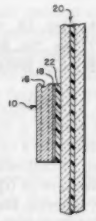
Paul Roentgen, Roetgen; Hubert Simons, Wuerselen-Bardenberg, and Werner Nuding, Aachen-Haaren, all of Fed. Rep. of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Jul. 6, 1978, Ser. No. 922,344

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2731100

Int. Cl.[2] B32B *17/10, 27/42*

U.S. Cl. 428—433 **7 Claims**



1. A process for bonding a metal part to a glass surface, which comprises applying an intermediate vitreous enamel coating to the metal part, and securing the metal part to the glass surface by means of a thermoplastic adhesive disposed between the vitreous enamel coating and the glass surface, said metal part being a suppport member for attachment of a rear-view mirror assembly and said glass surface being the inner side of an automobile glass windshield.

6. In a glass windshield having a metallic supporting member bonded to the glass surface by a thermoplastic adhesive for attachment thereto of a rear-view mirror assembly, the improvement which comprises an intermediate vitreous coating disposed on the metal surface of the member which is adhesively bonded to the windshield.

4,170,689

MAGNETO-OPTIC THIN FILM FOR MEMORY DEVICES

Akinori Katsui, and Kazumichi Egashira, both of Mito, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

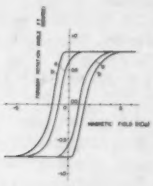
Continuation-in-part of Ser. No. 642,491, Dec. 19, 1975, abandoned. This application Jun. 28, 1977, Ser. No. 811,127
Claims priority, application Japan, Dec. 25, 1974, 49-3601; Sep. 29, 1975, 50-117499
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—457 13 Claims

1. A magneto-optic thin film on a substrate for memory devices, said film consisting essentially a composition defined by the formula

$$Mn_x(Cu_{1-y},Ni_{y'})\,Bi_z$$

wherein $X+y+z=1$, $0.15 \leqq x \leqq 0.70$, $0.10 \leqq y \leqq 0.55$, $0.11 \leqq z \leqq 0.55$, and y' is from 0.11 to 0.95.

3. A magneto-optic thin film on a substrate for memory devices, said film consisting essentially of Mn, Cu, Ni, Bi and a fifth element,



said Mn, Cu, Ni and Bi having the relationship defined by the formula

$$Mn_x(Cu_{-y},Ni_{y'})Bi_z$$

wherein $x+y+z=1$, $0.15 \leqq x \leqq 0.70$, $0.10 \leqq y \leqq 0.55$, $0.11 \leqq z \leqq 0.55$, and y' is from 0.11 to 0.95, and

said fifth element is selected from the group consisting of Ti, V, Cr, Fe, Nb, Te, Y, Ce, Nd, Gd and Dy.

4,170,690

PROCESS OF COATING WEATHERABLE, ABRASION RESISTANT COATING AND COATED ARTICLES

David C. Armbruster, Summit, N.J., and William F. Fischer, Langhorne, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 779,194, Mar. 18, 1977. This application Dec. 12, 1977, Ser. No. 859,512
Int. Cl.[2] B32B *9/04;* B05D *3/02*
U.S. Cl. 428—447 18 Claims

1. A method of making a weatherable abrasion-resistant coated substrate comprising adding a dilute acid hydrolyzing agent and a condensation catalyst to a composition comprising (A) about 30–50 parts by weight colloidal silica, and (B) about 50–70 parts by weight of a mixture of (i) dialkyldialkoxysilane and (ii) alkyl trialkoxysilane, wherein the weight ratio of (i) to (ii) is about 1:19 to about 1:4; and applying the resultant colloidal suspension to a substrate, then curing at a temperature of about 70°–160° C.

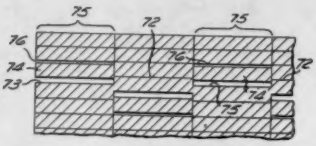
4,170,691

STEEL METAL WEB HANDLING METHOD, APPARATUS, AND COIL CONSTRUCT

John W. Rogers, c/o 25550 Chagrin Blvd., Cleveland, Ohio 44122

Continuation-in-part of Ser. No. 648,533, Jan. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 612,275, Sep. 11, 1975, abandoned. This application Aug. 12, 1976, Ser. No. 713,599
Int. Cl.[2] B21D *11/20, 31/00*
U.S. Cl. 428—572 11 Claims

1. A construct of wound elongated sheet metal web material having a plurality of laterally spaced, longitudinally extending parting lines in the surface thereof forming severably interconnected coiled strips defining daughter coils therebetween, each of said parting lines being cut in the surface of said web material continuously along its length to expose uninterrupted oppositely facing edge faces of adjacent strips, and residual



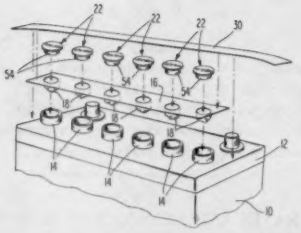
portions of web material of less thickness than the thickness of the web material bridging the interstice between said opposed edge faces forming frangible connecting means between adjacent strips.

4,170,692

DISPOSABLE BATTERY PACKING FOR CHARGED AND DUMPED BATTERIES

John M. Nees, Wyomissing, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 790,880, Apr. 26, 1977, Pat. No. 4,081,586. This application Jan. 12, 1978, Ser. No. 868,831
Int. Cl.[2] H01M *2/12*
U.S. Cl. 429—48 11 Claims



1. A charged and dumped battery package, comprising:

(a) a battery case having a plurality of venting ports therein;

(b) battery sealing strip means disposed over at least the top surface of said ports for at least partially sealing said ports, comprising thin sheet material having a plurality of indentations thereon forming protrusions extending from one side thereof into each of said ports, each of said protrusions having a minute vent hole therein;

(c) a plurality of disposable inserts, at least one for each port, for at least sealing said strip means with respect to said top surface of said ports, each of said inserts further comprising a top portion for compressing portions of said strip means against at least said top surfaces of said ports, said top portion having a vent aperture therethrough; and

(d) an adhesive strip applied generally over said inserts at least in the vicinity and over said apertures, said inserts further comprising means for creating a venting channel between said top portion and said adhesive strip.

4,170,693

COATING FOR LITHIUM ANODE, THIONYL CHLORIDE ACTIVE CATHODE ELECTROCHEMICAL CELL

Vincent O. Catanzarite, 356 Desert Inn Rd., Las Vegas, Nev. 98109

Filed Oct. 11, 1977, Ser. No. 840,521
Int. Cl.[2] H01M *6/14*
U.S. Cl. 429—48 15 Claims

1. An electrochemical cell comprising:

(a) a cathode current collector;

(b) an anode mechanically spaced from said cathode current collector; p1 (c) an ionically conductive electrolyte in physical contact with said anode and cathode current collector; said electrolyte consisting of a solute dissolved in a solvent that also performs the function of active cathode depolarizer, said electrolyte reacting with said anode to form surface compounds thereon;

(d) a surface compound limiting film contiguous to said anode, said film consisting of an organic compound selected from the group consisting of methyl cyanoacrilate and ethyl cyanoacrylate.

10. In a method of reducing passivation in an electrochemical cell having a lithium anode, a cathode current collector spaced from said anode, and ionically conductive electrolyte consisting of a solution of an ionically conductive solute dissolved in thionyl chloride; the steps comprising:

(a) prior to assembly, coating said anode with a liquid organic compound that cures to an adherent film; said compound being chosen from the group consisting of methyl cyanoacrilate, ethyl cyanoacrylte, ethyl acetate and acrylonitrile;

(b) curing said film;

(c) assembling said coated anode into said cell; and

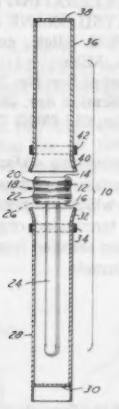
(d) burning-in said cell.

4,170,694

HERMETICALLY SEALED ALKALI METAL BATTERY CONTAINER

Gordon G. Chase, San Diego; Richard A. Harlow, and Viney K. Gupta, both of Newport Beach, all of Calif., assignors to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Dec. 4, 1978, Ser. No. 965,959
Int. Cl.[2] H01M *2/04*
U.S. Cl. 429—176 **6 Claims**



1. A hermetically sealed alkali metal battery container comprising:

a ceramic ring having top and bottom surfaces, said ceramic ring having an outer circumferential surface which is formed so as to have an upper and a lower contoured surface respectively adjacent said top and said bottom surfaces thereof;

an inner casing of a solid alkali ion-conductive material with an open end and a closed end;

sealing means for bonding said inner casing adjacent its open end to said ceramic ring so that said inner casing extends from said bottom surface of said ceramic ring;

a first metal outer casing with a closed end and a bell-shaped open end having a diameter slightly greater than the diameter of said lower contoured surface of said ceramic ring, said bell-shaped open end encircling said lower contoured surface;

a first sealing band engaging said bell-shaped open end of said first metal outer casing to compress the same into engagement with said lower contoured surface of said ceramic ring to form a hermetic seal therebetween; and

a second metal outer casing with a closed end and a bell-shaped open end having a diameter slightly greater than the diameter of said upper contoured surface of said ceramic ring, said bell-shaped open end encircling said upper contoured surface; and

a second sealing band engaging said bell-shaped open end of said second metal outer casing to compress the same into engagement with said upper contoured surface of said ceramic ring to form a hermetic seal therebetween.

5. A hermetic sealed subassembly for an alkali metal battery which comprises:

a ceramic ring having top and bottom surfaces and an outer circumferential surface which is formed to have at least one contoured surface thereon;

a metal outer casing having a bell-shaped open end which has a diameter slightly greater than the diameter of said contoured surface of said ceramic ring, said bell-shaped open end of said metal outer casing encircling said contoured surface of said ceramic ring; and

a sealing band engaging said bell-shaped open end of said metal outer casing to compress the same into engagement with said contoured surface of said ceramic ring to form a hermetic seal therebetween.

4,170,695

SELECTIVE PLUGGING OF BROKEN FIBERS IN TUBESHEET-HOLLOW FIBER ASSEMBLIES

William E. Brown, Walnut Creek, and Floris Y. Tsang, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 22, 1977, Ser. No. 835,567
Int. Cl.[2] H01M *6/20*
U.S. Cl. 429—193 **13 Claims**

1. The method of treating a tubesheet/hollow fiber assembly to ensure that any defective fibers included therein will be selectively plugged, said method comprising

A. providing as said assembly one which comprises a bundle of hollow fiber lengths passing through and engaged with a rigid wall member or tubesheet having first and second generally parallel faces, all of said lengths having open ends protruding from said first face and at least a majority of said lengths having closed-ended portions extending from said second face,

B. immersing said open fiber ends in a pool of a liquid sealant to a depth such that the distance between said first face and the surface of said pool external to the fiber ends is d, the force of capillary attraction between the walls of said fibers and said sealant being such that said sealant is drawn into said defective fibers for a distance greater than d, thereby filling them to a level beyond said face, the resistance to compression of the vapors within the closed ended lengths being such that said capillary attraction does not suffice to draw the sealant into said closed ended lengths beyond a point substantially below said level,

C. removing the unimbibed sealant from contact with said protruding fiber ends,

the imbibed sealant being so composed as to be convertible, in-situ and at a temperature below the distortion

temperature of said lengths, to plugs of a solid, non-porous material sealingly bonded to the fiber walls and having a coefficient of expansion substantially matching that of the fiber material,

D. converting the imbibed sealant to said plugs and

E. severing the protruding fiber ends from said tubesheet, with the result that the defective fibers in the treated assembly are plugged and the good fibers are not plugged.

4,170,696

ENZYME-IMMOBILIZATION CARRIER AND PREPARATION THEREOF

Hideo Hirohara; Shigeyasu Nabeshima, both of Ibaraki, and Tsuneyuki Nagase, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 3, 1978, Ser. No. 875,120
Claims priority, application Japan, Nov. 5, 1977, 52-132750
Int. Cl.[2] C08G *2/00*
U.S. Cl. 521—29 **22 Claims**

1. An enzyme-immobilization carrier which comprises a macroporous, synthetic anion-exchange resin having a specific surface area of at least 1 m^2/g-dry resin and containing macropores with a pore size of 100 Å to 2,000 Å, of which total volume is at least 0.1 cc/g-dry resin; said resin comprising (a) a phenol-formaldehyde condensate matrix and diethylaminoethyl groups linked to the matrix through an ether linkage, wherein the ion-exchange capacity of the resin is not less than 1 meq/g-dry resin, (b) a phenol-formaldehyde condensate matrix having primary amino groups, secondary amino groups or a mixture thereof as an anion-exchanger and diethylaminoethyl groups linked to the matric through an ether linkage or to said primary or secondary amino groups to form a secondary or tertiary amino group respectively, wherein the ion-exchange capacity due to the diethylaminoethyl groups is not less than 0.5 meq/g-dry resin and the total ion-exchange capacity is not less than 1 meq/g-dry resin, or (c) a crosslinked polystyrene matrix having primary amino groups, secondary amino groups or a mixture thereof as an anion-exchanger and diethylaminoethyl groups linked to said primary or secondary amino group to form a secondary or tertiary amino group respectively, wherein the ion-exchange capacity due to the diethylaminoethyl groups is not less than 0.5 meq/g-dry resin and the total ion-exchange capacity is not less than 1 meq/g-dry resin.

4,170,697

PROCESS FOR THE PRODUCTION OF POLYISOCYANATE SILICATE SOLID OR CELLULAR SOLID PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 845,464, Oct. 25, 1977, Pat. No. 4,120,937. This application Jun. 23, 1978, Ser. No. 918,671
Int. Cl.[2] C08J *9/00*
U.S. Cl. 521—82 **20 Claims**

1. The process for the production of a polyisocyanate silicate resinous product by the following steps:

(a) adding a silicon halide to a polyol while agitating at ambient temperature and pressure, thereby producing a polyol silicate resinous product;

(b) adding a polyisocyanate to said polyol silicate resinous product while agitating for 10 to 60 minutes and in the amount sufficient to produce an isocyanate-terminated polyisocyanate silicate prepolymer, thereby

(c) producing an isocyanate-terminated polyisocyanate silicate prepolymer,

(d) adding a curing agent to the isocyanate-terminated polyisocyanate silicate prepolymer and mixing thoroughly, thereby

(e) producing a polyisocyanate silicate resinous product.

4,170,698
Patent Not Issued For This Number

4,170,699

BEAD SIZE DISTRIBUTION IN THE SUSPENSION POLYMERIZATION OF VINYL AROMATIC MONOMERS IN THE PRESENCE OF GLUTAMIC ACID

Harold A. Wright, Murrysville, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.

Filed Jun. 29, 1978, Ser. No. 920,610
Int. Cl.[2] C08F *12/06, 12/08, 14/02*
U.S. Cl. 526—215 **5 Claims**

1. In a process for producing polymer beads by suspending a vinyl aromatic monomer, selected from the group consisting of styrene, alphamethylstyrene, monochlorostyrene and dichlorostyrene, containing a monomer-soluble, free-radical producing catalyst in an aqueous medium with the aid of from 0.1 to 2.0 percent by weight based on monomer of a finely divided, difficultly water-soluble phosphate suspending agent and a water-soluble bisulfite or persulfate modifier and subjecting the suspension to an elevated temperature to cause said monomer to polymerize, the improvement for producing a narrow distribution of bead diameter sizes which comprises adding to said suspension between 0.01 and 5.0 percent by weight based on monomer of glutamic acid as adjunct modifier.

4,170,700

METHOD FOR ACCELERATING SURFACE CURING OF ORGANOPOLYSILOXANE COMPOSITIONS

Edward Sweet, Blissfield, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Continuation-in-part of Ser. No. 767,940, Feb. 11, 1977, abandoned. This application Apr. 26, 1978, Ser. No. 902,018
Int. Cl.[2] C08G *77/06*
U.S. Cl. 528—12 **7 Claims**

1. A method for accelerating surface curing of a composition which is vulcanizable at room temperature in the presence of atmospheric moisture which comprises exposing a composition containing hydroxyl terminated organopolysiloxanes and an aminosilicon compound selected from the group consisting of aminosilanes of the formula

$$R''_z\,Si(NY_2)_{4-z}$$

and aminosilazanes of the formula

$$(Y_2N)_a\,R''_b\,SiNH[R''_b\,(Y_2N)_c\,SiNH]_g\,SiR''_b\,(NY_2)_a$$

in which R'' is selected from the group consisting of alkyl, aryl, aralkyl and alkaryl radicals, Y is selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, alkaryl and aralkyl radicals, z is 0 or 1, g is at least 1, a is 2 or 3, b is 0 or 1 and c is 1 or 2 to a gaseous medium containing moisture and carbon dioxide in which the carbon dioxide is present in an amount of at least 0.1 percent by volume.

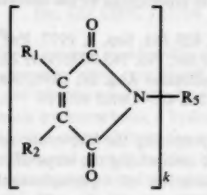
4,170,701
PROCESS FOR THE PREPARATION OF (THIO)HYDANTOINS MODIFIED WITH AMIDE GROUPS

Ludwig Rottmaier, and Rudolf Merten, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 19, 1978, Ser. No. 897,666
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 2718103; May 18, 1977, 2722513
Int. Cl.[2] C08G *18/00*
U.S. Cl. 528—49 15 Claims

1. A process for the preparation of a (thio)hydantoin substituted by amide groups wherein a maleic acid imide represented by the following general formula I

(I)



in which

R_1 and R_2, which may be the same or different, represent hydrogen or an optionally substituted aliphatic group,

R_5 represents hydrogen or an optionally substituted aliphatic, cycloaliphatic, aromatic, aliphatic-aromatic or heterocyclic group and

k represents an integer of from 1 to 3,

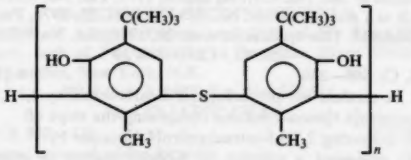
is reacted with a primary monoamine or polyamine, and the reaction product obtained is reacted with an organic mono- or polyiso(thio)cyanate and subsequently cyclised by heating.

4,170,702
PROCESS FOR POLYMERIZING A THIOBISPHENOL

Richard H. Hirsch, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 751,774, Dec. 16, 1976, Pat. No. 4,097,534. This application Jun. 23, 1978, Ser. No. 918,737
The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.
Int. Cl.[2] C07C *148/00, 148/04*
U.S. Cl. 528—219 25 Claims

1. Process for preparing a polymer represented by the formula



wherein

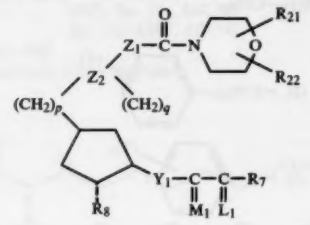
n has a value from 2 to about 10 which comprises reacting 4,4'-thiobis(6-t-butyl-m-cresol) with molecular oxygen at a molar ratio from 2 to about 4 in the presence of copper salt complexed with amine at a temperature from about 20° C. to the decomposition temperature of said polymer, the molar ratio of said cresol to said amine being less than about 40 and the molar ratio of said salt to said amine being less than about 1.4, said amine being selected from pyridine, cyclo(C_3–C_{12} alkyl)amines, C_1–C_{20} alkylamines, di(C_1–C_{20} alkyl)amines, C_2–C_{12} alkylene diamines and di- and tetra(C_1–C_2 alkyl)-(C_2–C_4 alkylene)diamines.

4,170,703
5-HYDROXY-PGI$_1$ MORPHOLINYLAMIDES

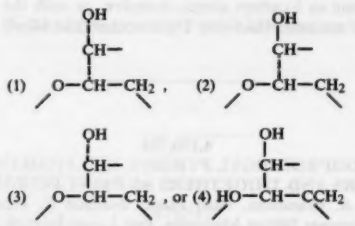
Roy A. Johnson, and John C. Sih, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 815,648, Jul. 14, 1977, Pat. No. 4,110,532. This application Apr. 24, 1978, Ser. No. 899,200
Int. Cl.[2] C07D *407/02*
U.S. Cl. 542—426 47 Claims

1. A prostacyclin analog of the formula



wherein Z_2 is



wherein one of p or q is the integer zero or one and the other is the integer zero;

wherein Z_1 is

(1) $-(CH_2)_g-CH_2-CH_2-$,

(2) $-(CH_2)_g-CH_2-CF_2-$, or

(3) trans$-(CH_2)_g-CH=CH-$,

wherein g is the integer one, 2, or 3 when q is zero and zero, one, or 2 when q is one;

wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;

wherein Y_1 is

(1) trans$-CH=CH-$,

(2) cis$-CH=CH-$,

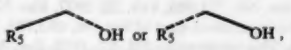
(3) $-CH_2CH_2-$,

(4) trans$-CH=C(Hal)-$, or

(5) $-C\equiv C-$

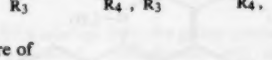
wherein Hal is chloro or bromo;

wherein M_1 is

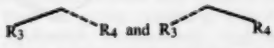


wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive:

wherein L_1 is



or a mixture of



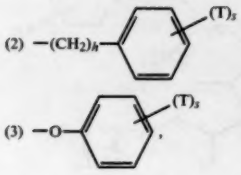
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being

the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_{21} and R_{22} are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive; and

wherein R_7 is

(1) $-(CH_2)_3-CH_3$,



wherein h is the integer zero or one; s is the integer zero, one, 2, or 3; and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or with the proviso that not more than two T's are other than alkyl.

4,170,704

IODOPROPARGYL PYRIDYL AND PICOLINYL ETHERS AND THIOETHERS AS PAINT FUNGICIDES

Harold A. Brandman, Glen Ridge; Joachim E. Freudewald, Morristown; Milton Manowitz, Fair Lawn; Edward J. Nikawitz, Glen Rock, and Frederick H. Sharpell, Jr., Pequannock, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Apr. 20, 1978, Ser. No. 898,759

Int. Cl.[2] C07D *213/02, 213/30, 213/32*

U.S. Cl. 546—290 **26 Claims**

1. A compound of the formula:

$$R-O-CH_2C\equiv Cl$$

wherein R is a 3-pyridyl radical.

4,170,705

SUBSTITUTED HYDROXY PYRIDONES

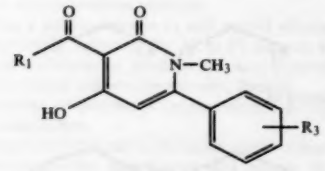
Jeffrey Nadelson, Denville, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 771,006, Feb. 22, 1977, Pat. No. 4,122,182, which is a continuation-in-part of Ser. No. 693,703, Jun. 7, 1976, abandoned. This application Jul. 17, 1978, Ser. No. 925,197

Int. Cl.[2] C07D *213/44*

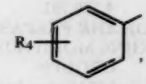
U.S. Cl. 546—296 **1 Claim**

1. A compound of the formula



where

R_1 represents straight chain lower alkyl or



where

R_4 represents hydrogen or halo having an atomic weight of about 19 to 36, and

R_2 represents lower alkyl, and

R_3 represents hydrogen or halo as defined above.

4,170,706

METHOD FOR PREPARING THE BISPICRATE SALT OF 2,3,7,8-TETRAAZASPIRO[4.4]NONANE

Arnold T. Nielsen, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 829,761, Sep. 1, 1977, Pat. No. 4,125,728, which is a division of Ser. No. 743,723, Nov. 22, 1976, Pat. No. 4,066,833. This application Aug. 28, 1978, Ser. No. 937,635

Int. Cl.[2] C07D *487/10*

U.S. Cl. 548—356 **2 Claims**

1. A method for preparing the bispicrate salt of 2,3,7,8-tetrazaspiro[4.4]nonane comprising the steps of:

A. preparing a solution of 4-phenylurazole in ethanolic potassium ethoxide and a solution of pentaerythrityl tetrabromide in dimethylformamide, forming a reaction mixture from the two solutions, reacting it to cause 2,2-diphenyl-1,1′,3,3′-tetraoxo-6,6′-spirobi[hexahydropyrazolo[1,2-a]-s-triazole] to be formed and recovering the s-triazole;

B. reacting the s-triazole with sodium hydroxide and hydrochloric acid in succession to form 2,3,7,8-tetraazaspiro[4.4]nonane bishydrochloride and recovering the bishydrochloride;

C. Reacting the bishydrochloride with potassium bisulfate to form 2,3,4,8-tetrazaspiro[4.4]nonane sulfate and recovering the sulfate;

D. subjecting the sulfate to ammonia to form 2,3,7,8-tetraazaspiro[4.4]nonane; and

E. reacting the nonane with picric acid.

4,170,707

METHOD FOR PREPARING 3,8-DICARBOMETHOXY-2,3,7,8-TETRAAZASPIRO[4.4-]NONA-1,6-DIENE

Arnold T. Nielsen, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 829,761, Sep. 1, 1977, Pat. No. 4,125,728, which is a division of Ser. No. 743,723, Nov. 22, 1976, Pat. No. 4,066,833. This application Aug. 28, 1978, Ser. No. 937,634

Int. Cl.[2] C07D *487/10*

U.S. Cl. 548—356 **4 Claims**

1. A method for preparing 3,8-dicarbomethoxy-2,3,7,8-tetraazaspiro[4.4]nona-1,6-diene comprising the steps of:

A. preparing 2,3,7,8-tetraazaspiro[4.4]nonane by:

(1) preparing a solution of 4-phenylurazole in ethanolic potassium ethoxide and a solution of pentaerythrityl tetrabromide in dimethylformamide, forming a reaction mixture from the two solutions, reacting it to cause 2,2′-diphenyl-1,1′,3,3′-tetraoxo-6,6′-spirobi[hexahydropyrazolo[1,2-a]-s-triazole to be formed and recovering the s-triazole;

(2) reacting the s-triazole with sodium hydroxide and hydrochloric acid in succession to form 2,3,7,8-tetraazaspiro[4.4]nonane bishydrochloride and recovering the bishydrochloride;

(3) reacting the bishydrochloride with potassium bisulfate to form 2,3,7,8-tetraazaspiro[4.4]nonane sulfate and recovering the sulfate; and

(4) subjecting the sulfate to ammonia to form said 2,3,7,8-tetraazaspiro[4.4]nonane; and finally

B. refluxing an ethanol solution of said nonane, sodium carbonate and methyl chloroformate.

4,170,708

PROCESS FOR PREPARING AROMATIC URETHANES

Yutaka Hirai; Katsuharu Miyata, and Seiji Hasegawa, all of Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Mar. 8, 1976, Ser. No. 664,995
Claims priority, application Japan, Apr. 2, 1975, 50/39119
Int. Cl.[2] C07C *125/06*
U.S. Cl. 560—24 **11 Claims**

1. A process for preparing an aromatic urethane comprising interacting an aromatic nitro compound selected from the group consisting of nitro-aromatic hydrocarbons and halogenated nitro-aromatic hydrocarbons, a hydroxyl group-containing organic compound selected from the group consisting of a monohydric alcohol and a polyhydric alcohol and carbon monoxide in the presence of a catalytic system composed of (1) a catalyst selected from the group consisting of elemental selenium and a selenium compound and (2) a promoter composed of a bicyclic amidine having the following general formula:

wherein R_1 is a linear alkylene group containing 3 to 6 carbon atoms, R_2 is a linear alkylene group containing from 2 to 5 carbon atoms, said alkylene group being non-substituted or substituted with an alkyl group containing from 1 to 4 carbon atoms or a halogen atom, and a member selected from the group consisting of a phenolic compound and a carboxylic acid.

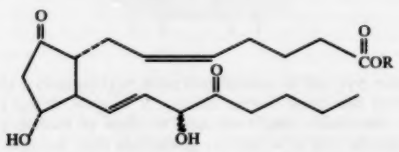
4,170,709

16-KETO PGE_2 METHYL ESTERS

Wenling Kao, King of Prussia, and Richard W. Rees, Bryn Mawr, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,614
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—121 **3 Claims**

1. A compound of the formula:



wherein R is hydrogen, an alkyl group of from 1 to 6 carbon atoms, an alkali metal, or a pharmaceutically acceptable nontoxic cation derived from ammonia or a basic amine.

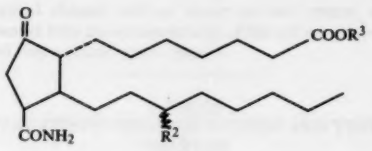
4,170,710

PROSTAGLANDIN DERIVATIVES

Donald P. Strike, St. Davids, and Wenling Kao, Devon, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 695,228, Jun. 11, 1976, Pat. No. 4,067,898, which is a continuation of Ser. No. 494,118, Aug. 2, 1974, Pat. No. 4,076,730, which is a division of Ser. No. 384,769, Aug. 1, 1973, Pat. No. 3,845,042, which is a continuation-in-part of Ser. No. 282,200, Aug. 21, 1972, abandoned. This application Oct. 17, 1977, Ser. No. 842,709
Int. Cl.[2] C07C *177/00*
U.S. Cl. 562—503 **2 Claims**

1. A compound of the formula:



wherein R^2 is hydroxy or acetoxy and R^3 is hydrogen or lower alkyl.

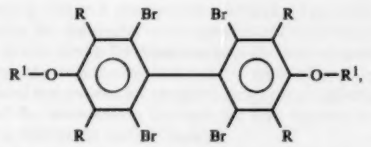
4,170,711

BROMINATED BIPHENOL DERIVATIVES

Charles M. Orlando, Schenectady, N.Y., and Francois A. Lavallee, Willoughby Hills, Ohio, assignors to General Electric Company, Schenectady, N.Y.

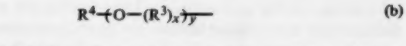
Continuation of Ser. No. 450,334, Mar. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 169,517, Aug. 5, 1971, Pat. No. 3,929,908. This application Sep. 27, 1976, Ser. No. 726,617
Int. Cl.[2] C07C *43/22*
U.S. Cl. 568—610 **7 Claims**

1. A brominated biphenol selected from monomeric halogenated organo compounds of the formula



wherein independently each R is selected from primary alkyl groups, each R^1 is selected from hydrogen or groups identified hereafter in (a) and (b), subject to the proviso that at least one R^1 is selected from the group consisting of

(a) R^2—



(b)

wherein R^2 is selected from the group consisting of alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl and mixtures thereof, R^3 is selected from the group consisting of alkylene, cycloalkylene, arylene and mixtures thereof, R^4 is selected from the group consisting of hydrogen, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl and mixtures thereof, x is a positive integer of at least 1, and y is a positive integer of at least 1.

4,170,712
TILTABLE ARC FURNACE

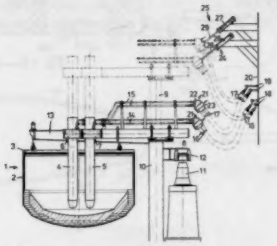
Emil Elsner, Baden-Baden, Fed. Rep. of Germany, assignor to Korf-Stahl AG, Baden-Baden, Fed. Rep. of Germany

Filed Jun. 6, 1978, Ser. No. 913,060

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 2725686

Int. Cl.[2] H05B *7/11*

U.S. Cl. 13—10 **9 Claims**



1. In combination: a support and a tiltable arc furnace spaced from said support, said arc furnace comprising electrodes, liftable electrode carrier arms supporting said electrodes, heavy-current conductors electrically connected to said electrodes and including substantially inflexible conductor means and flexible conductor means, releasable coupling means in said conductor means and including first coupling elements associated with said flexible conductor means and second coupling elements associated with said inflexible conductor means, and actuating and holding means provided at said support and including means for grasping, uncoupling and holding said first coupling elements.

4,170,713
CHANNEL-TYPE INDUCTION FURNACE

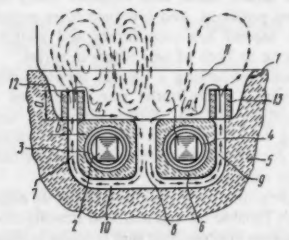
Imant E. Butseniex, ulitsa Mira 19, kv. 14, Salaspils; Margarita Y. Levina, ulitsa Sormouskaya 10, korpus 1, kv. 29, Moscow; Alexandr A. Prostyakov, ulitsa Veshnyakovskaya 35/26, kv. 66, Moscow; Mikhail Y. Stolov, ulitsa Volochaevskaya 40a, kv. 36, Moscow; Vladimir I. Sharamkin, ulitsa Mira 16/7 kv. 313, and Eduard V. Scherbinin, ulitsa Mira 16/6, kv. 21, both of Salaspils, all of U.S.S.R.

Filed Apr. 7, 1978, Ser. No. 894,386

Claims priority, application U.S.S.R., Apr. 7, 1977, 2475290; Jul. 14, 1977, 2507843

Int. Cl.[2] H05B *5/14*

U.S. Cl. 13—29 **11 Claims**



8. In a channel-type induction furnace of the type comprising: a hearth adapted to contain molten metal and having a cavity defined by walls; at least one closed transformer core; coils supplied with alternating current, arranged around said transformer core and operable to induce current in the metal; a housing adapted to accommodate said transformer core with said coils so that the walls of said housing form at least one central vertical channel, two outer vertical channels and one horizontal channel, through which pass a flow of molten metal; said vertical channels communicating with said cavity of said hearth; said horizontal channel interconnecting said vertical channels with one another; each of said outer vertical channels having a separate one of said coils associated therewith to induce electric current flow in molten metal contained therein, the improvement comprising

two tubular members formed of electrically non-conducting refractory material;

a first of said tubular members being adjoined with and extending upwardly of a first said outer vertical channels, and a second said tubular member being adjoined to and extending upwardly of a second said outer vertical channels;

said first tubular member having a first upright wall disposed between said first outer vertical channel and said central vertical channel and no closer to said central vertical channel than the symmetry axis of the coil associated with said first vertical outer channel.

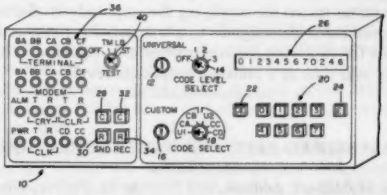
4,170,714
DIGITAL CRYPTOGRAPHIC SYSTEM AND TESTING THEREOF

Kenneth M. Branscome; Barrie O. Morgan, both of Dallas, and Merlon B. Carter, Richardson, all of Tex., assignors to Datotek, Inc., Dallas, Tex.

Division of Ser. No. 740,599, Nov. 10, 1976, Pat. No. 4,133,973. This application May 26, 1978, Ser. No. 910,010

Int. Cl.[2] H04L *9/00*

U.S. Cl. 178—22 **2 Claims**



1. In a digital cryptographic system having a first station, including a send data terminal which applies data signals through an enciphering unit for transmission through a first modem over a data link to a second station including a second modem, the output from the second modem applied through a deciphering unit to a receive data terminal, an automatic testing system for the digital cryptographic system comprising:

first switch means for disconnecting the send data terminal from the enciphering unit and for generating a predetermined test pattern for enciphering by the enciphering unit and for transmission through the first modem over the data link to the second modem,

means in the deciphering unit for deciphering said test pattern,

means on the deciphering unit for visually displaying the deciphered test pattern,

second switch means for disconnecting the receive data terminal from the deciphering unit,

means in the deciphering unit for generating a predetermined test pattern and for enciphering said test pattern for transmission through the second modem over the data link to the first modem,

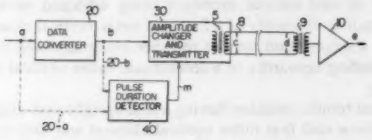
means in the enciphering unit for deciphering said test pattern, and

means at the first station for visually displaying the deciphered test pattern, wherein said visual display at the first station will coincide with said visual display at the second station to indicate proper operation of the digital cryptographic system.

4,170,715
DATA COMMUNICATION SYSTEM

Sadao Mizokawa, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 3, 1977, Ser. No. 821,340
Claims priority, application Japan, Aug. 7, 1976, 51-94270
Int. Cl.[2] H04L *25/49, 3/00*
U.S. Cl. 178—68 5 Claims



1. A data communication system comprising:

data converting means for converting nonreturn-to-zero data signals to digital pulse-coded transmission data signals including a combination of two pulse signals whose pulse durations and different from each other;

delay means for delaying said nonreturn-to-zero data signals by a prescribed time delay;

amplitude level changing means for receiving said digital pulse-coded transmission data signals from said data converting means and the output of said delay means and changing the amplitude level of said digital pulse-coded transmission data signals in accordance with the pulse duration of said digital pulse-coded transmission data signals on the basis of the output from said delay means;

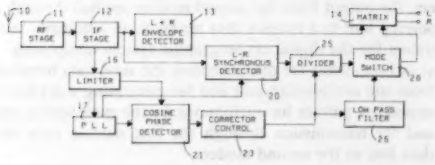
transmitter means for supplying the amplitude level-changed transmission data signals to a transmission path; and

means for receiving the transmitted data signals and detecting said data at a constant amplitude level.

4,170,716
AM STEREO RECEIVER WITH CORRECTION LIMITING

Francis H. Hilbert, Addison, and Norman W. Parker, Wheaton, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 14, 1977, Ser. No. 842,026
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—1 GS 6 Claims



1. In an AM stereo receiver for receiving signals of the form $(1+L+R)\cos(\omega_c t+\phi)$ where ϕ is arc tan $\{(L-R)/(1+L+R)\}$, L and R represent first and second program information signals, and $\omega_c t$ is a carrier frequency, and requiring a cos ϕ correction signal to restore the stereo information, a corrector control arrangement comprising in combination;

input means for receiving the broadcast signal and deriving therefrom an intermediate frequency signal;

means for detecting stereo information in the intermediate frequency signal;

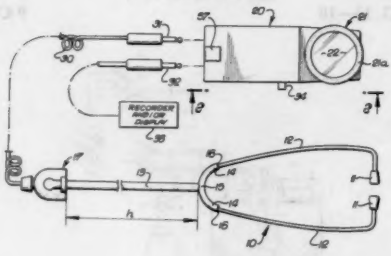
means coupled to the input means for deriving a correction signal which is a function of the cosine of the angle of modulation;

control means coupled to limit the range of values of the correction signal.

4,170,717
ELECTRONIC STETHOSCOPE

James C. Walshe, 9335 Lubec St., Downey, Calif. 90240

Continuation of Ser. No. 770,224, Feb. 18, 1977, abandoned.
This application Jun. 12, 1978, Ser. No. 914,732
Int. Cl.[2] A61B *7/04*
U.S. Cl. 179—1 ST 3 Claims



1. In a portable, lightweight, self-contained electronic stethoscope, the combination comprising

(a) a lightweight enclosure containing a speaker,

(b) a housing separate and remote from said enclosure,

(c) a transducer carried by the housing, the transducer including a microphone located to be placed in proximity to a patient's body, the microphone having an exposed diaphragm to acoustically couple to the patient's body,

(d) circuitry in the housing and having an input terminal coupled with the transducer, said circuitry including amplifier means and filter means, and a battery power supply in the housing and coupled with said circuitry, said circuitry having a first output terminal,

(e) flexible electrical connection means outside the housing and coupling said first output terminal with said speaker, said connection means including a flexible and extensible cord,

(f) said circuitry including adjustable means to control the amplitude of the signal transmitted to the speaker, there being a manually controllable part on the housing connected with said adjustable means which includes a potentiometer coupled to the input of an output amplifier defined by said amplifier means, said part comprising a knob projecting from one side of the housing, said transducer including microphone protecting ring structure projecting from the opposite side of the housing opposite said knob,

(g) said filter means comprising an adjustable low-pass filter means, there being a manually controllable element on the housing and connected with said adjustable low-pass filter means to adjust same, said element being movable between two positions, said low-pass filter means including first and second low-pass filters and switch means to connect one or both of said filters in series,

(h) said enclosure having a tubular nipple defining only a single acoustic wave outlet port connected to a single flexible tubing of the stethoscope, said single tubing branching to become two tubings at a location spaced from the enclosure, the speaker acoustically facing toward said single outlet port,

(i) said single outlet port being in lengthwise alignment with said single flexible tubing, and said flexible electrical connection means approaching said housing in alignment with said outlet port and said single flexible tubing, whereby the enclosure effectively becomes an extension of said single tubing and of said flexible electrical connection means, the tubing end removably telescopically fitting the nipple,

(j) the housing including a one-hand graspable section with said knob and said manually controllable element located proximate one another yet projecting in different directions so as to be manipulable by the fingers of the user's

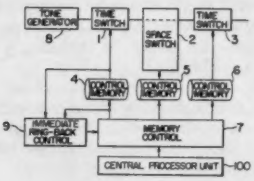
hand, said first output terminal located at an end of said hand graspable section remote from said microphone.

4,170,718

IMMEDIATE RING-BACK CONTROL SYSTEM FOR TIME-DIVISION TELEPHONE EXCHANGE

Katsuyuki Miyazaki, 2000, Kamikuratacho, Totsuka-ku, Yokohama, and Akira Horiki, 4338, Kamariyacho, Kanazawa-ku, Yokohama, both of Japan

Filed Dec. 29, 1977, Ser. No. 865,710
Claims priority, application Japan, Jun. 8, 1977, 52-66697
Int. Cl.[2] H04J *3/12*
U.S. Cl. 179—15 BY 4 Claims



1. In a time-division telephone exchange comprising:

a time-division switching network of an incoming time switch-space switch-outgoing time switch system, said switching network including a plurality of incoming time switches and a plurality of outgoing time switches;

a plurality of control memories, each of which is associated with one of said incoming and outgoing time switches, for controlling the same; and

a memory control circuit for controlling a plurality of said control memories, said memory control circuit being controlled by a central processor unit of a stored program type;

the improvement further comprising an immediate ring-back control system comprising:

(a) a tone generator for supplying a continuous ring-back tone code to a plurality of successive addresses of at least one of said incoming time switches and an interrupted ring-back tone code to at least one other address of said incoming time switch; and

(b) an immediate ring-back control circuit responsive to said memory control circuit and controlling the incoming time switch which is associated with said tone generator, comprising:

a timing circuit for generating timing pulses at predetermined time intervals;

a circuit coupled to said memory control circuit and said timing circuit and receiving a first address number of said successive addresses of said incoming time switch to which the continuous ring-back tone stored in response to said central processor unit at addresses of said control memory is supplied upon connection of said ring-back tone, and sequentially updating said first address number by a next address number of said successive addresses to which said continuous ring-back tone code is supplied, and finally updating the last address number of said successive addresses by the other address of said incoming time switch to which said interrupted ring-back tone is supplied so that,

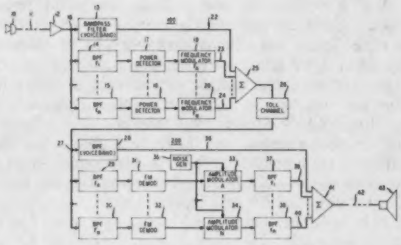
upon the connection of the ring-back tone, the continuous ring-back tone is sent to a calling subscriber for a period of time corresponding to a predetermined number of timing pulses, after which period of time said interrupted ring-back tone is sent to said calling subscriber.

4,170,719

SPEECH TRANSMISSION SYSTEM

Osamu Fujimura, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 14, 1978, Ser. No. 915,371
Int. Cl.[2] H04B *1/66*
U.S. Cl. 179—15.55 R 12 Claims



1. A system (FIG. 1) for transmitting speech signals having voiced components substantially confined to one frequency range and unvoiced components with substantial energy in another frequency range over a transmission channel (26) with bandwidth embracing only the one frequency range, there being a complementary transmitter (100) and receiver (200) at opposite channel terminals CHARACTERIZED IN THAT

at the transmitter terminal (100)

voiced components are separated by selective filtration (13) from unvoiced components of a speech signal to be transmitted,

power levels of two or more discrete frequencies in the unvoiced component are detected by further selective filtration (14, 15) in the other frequency range and amplitude components proportional to such power levels are modulated (19,20) to a band edge of the one frequency range, and

a composite signal constituted of unprocessed speech components in the one frequency range and said amplitude components measured at such discrete frequencies in the other frequency range after translation to a band edge of the one frequency range is applied to the limited bandwidth transmission channel (26); and

at the receiver terminal (200)

unvoiced speech components in the other frequency range are reconstructed by modulating the output of an independent noise generator (35) in accordance with the amplitude (33,34) of components corresponding to discrete frequencies selected by filtration (29,30) and restored to the other frequency range (31,32) at the band edge of the one frequency range in a received composite signal, and

unprocessed voice speech components separated by selective filtration (28) in the received composite signal in the one frequency range are combined (41) with simulated unvoiced components excited in the other frequency range to reconstitute a speech signal with enhanced naturalness and intelligibility spanning both the one and the other frequency ranges.

4,170,720

AGC CIRCUIT PARTICULARLY FOR A HEARING AID

Mead C. Killion, 935 Wilshire, Elk Grove Village, Ill. 60007

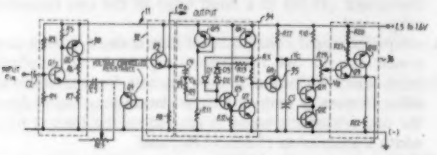
Filed Mar. 3, 1978, Ser. No. 883,180
Int. Cl.[2] H04R *25/00;* H03F *1/34*
U.S. Cl. 179—107 R 13 Claims

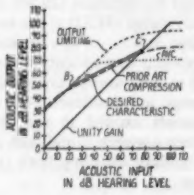
1. A high fidelity head-worn hearing aid including microphone means for receiving an audio input signal and converting said audio signal to an electrical signal, variable gain amplifier and gain control circuitry receiving said electrical signal from the microphone, receiver means for receiving the electrical signal from said amplifier circuitry and converting

said electrical signal to an audio signal, means for coupling said audio signal from the receiver to the ear of the user, low voltage power supply means for providing electrical power to energize said microphone means, said receiver means and said amplifier and gain control circuitry, a feedback path in said amplifier circuitry, a voltage controlled resistance means in said feedback path, logarithmic amplifier circuit means responding to the electrical signal from said microphone and providing a voltage to said voltage controlled resistance having a logarithmic relationship over a selected intermediate input signal levels and a deviation toward linear operation at higher input signal levels for providing a selected response to the intermediate input signals and a rapid decrease in the voltage provided to the voltage controlled resistance at the upper threshold of compression whereby the voltage controlled resistance means will have negligible effect on the operation of the amplifier circuitry at high signal levels and a low distortion, low noise, selected compression ratio amplifier circuitry is provided for said hearing aid.

12. A high fidelity hearing aid including a low power consumption automatic gain control amplifier suitable for operation with a miniature battery such as used with head-worn hearing aids, said automatic gain control amplifier providing automatic gain control for inputs between a fixed lower threshold voltage and a fixed upper threshold voltage and with a low distortion, fixed gain operation of the amplifier for inputs above the upper threshold and for inputs below the lower threshold.

13. An automatic gain control circuit including a feedback subcircuit, a voltage controlled impedance means comprising at least one solid state element in said feedback subcircuit, said voltage controlled impedance means providing a variable impedance up to a selected high signal level, said feedback subcircuit effecting a variable gain determined by said voltage controlled impedance means, a logarithmic amplifier means, means for rectifying the output of said logarithmic amplifier





and coupling said output from said rectifying means to said solid state element to cause said element to be sensibly nonconducting above said selected signal level for increasing the impedance of said voltage controlled impedance for signals above said selected signal level to cause said voltage controlled impedance means to have negligible effect on said gain control circuit above said high signal level, whereby said automatic gain control circuit provides a preselected gain up to said signal level and essentially constant gain above said signal level and thereby obtains a low noise, variable gain amplifier circuit with low distortion at high signal levels.

4,170,721

MICROPHONE WITH MOLDED BLOCK AMPLIFIER ELECTROSTATIC

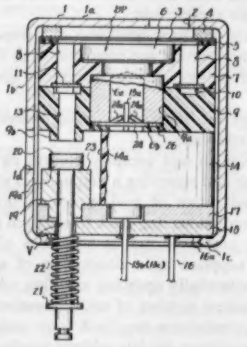
Hisanori Ishibashi, Tokyo, and Tsuneso Tajima, Machida, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 643,855, Dec. 23, 1975, abandoned. This application Dec. 1, 1977, Ser. No. 856,319
Claims priority, application Japan, Dec. 27, 1974, 50-3688
Int. Cl.[2] H04R *19/04*
U.S. Cl. 179—111 R **3 Claims**

1. A condenser microphone comprising:
a housing having an opening;
diaphragm means facing said opening;
a backplate assembly consisting of a backplate and insulating means for supporting said backplate in position under and adjacent said diaphragm means and having at least one acoustic cavity;
separate molded block means for encapsulating an active element having electrodes and separably positioned in said housing under the backplate assembly; a recess in said backplate assembly; and
mechanically deflectable connection means positioned in said recess and comprising slidingly telescoping conductive elements separably connecting one of said electrodes to said backplate with a residual resilient spring bias transversely urging said conductive elements into electrical contact.

2. A condenser microphone comprising:
a housing having an opening;
diaphragm means facing said opening;
a backplate assembly consisting of a backplate and insulating means for supporting said backplate in position under and adjacent said diaphragm means and having at least one acoustic cavity;
separate molded block means for encapsulating an active element having electrodes and separably positioned under the backplate assembly; and
mechanically deflectable connection means separably connecting one of said electrodes to said backplate with a residual resilient spring bias maintaining said connection;
wherein said molded block is relieved to provide a communication path therethrough to said cavity; and
wherein said block provides a cut portion to form said communication path, and further includes valve means in said cut portion for selectively opening or closing said path.

3. A condenser microphone comprising:



a housing having an opening;
diaphragm means facing said opening;
a backplate assembly consisting of a backplate and insulating means for supporting said backplate in position under and adjacent said diaphragm means and having at least one acoustic cavity;
separate molded block means for encapsulating an active

element having electrodes and separably positioned under the backplate assembly; and

mechanically deflectable connection means separably connecting one of said electrodes to said backplate with a residual resilient spring bias maintaining said connection;

wherein said molded block is relieved to provide a communication path therethrough to said cavity; and

wherein said relieved portion of said block faces an opening in said housing facing in a direction laterally of the said opening.

4,170,722

APPARATUS AND METHOD FOR REMOTE TESTING OF A LOOP TRANSMISSION PATH

Tom L. Blackburn, San Jose, Calif., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

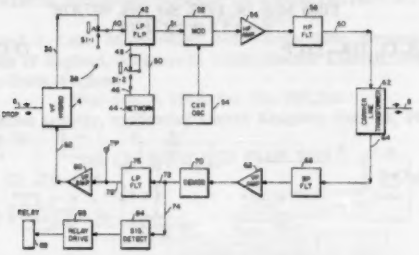
Filed Feb. 17, 1978, Ser. No. 878,632
Int. Cl.[2] H04B *3/46*
U.S. Cl. 179—175.3 R **10 Claims**

1. Apparatus for loop testing of a carrier system channel having first and second terminal ends, the first terminal end including a lowpass filter, a first modulator and a first oscillator connected to an input of said first modulator, the second terminal end including a second carrier oscillator which is disabled when the VF drop is idle and a second modulator, said apparatus comprising:

means for temporarily changing the characteristics of the lowpass filter so as to generate a first test signal having a predetermined amplitude higher than the signals normally present in the channel and at a frequency which is within the passband of the channel;

means for applying said first test signal to the input of said first modulator so as to modulate the first carrier oscillator signal with said first test signal to obtain a first modulated carrier frequency signal for transmission to the second terminal end of the channel;

means for recovering at said second terminal the first test signal from the modulated signal transmitted from said first terminal;



means responsive to said recovered first test signal to energize said second carrier oscillator, whereby an artificial seizure of the drop is effected and the second carrier oscillator output signal is applied to an input of said second modulator and is transmitted via said second modulator to said first terminal end;

means for applying the recovered test signal at reduced amplitude to another input of said second modulator to generate a second modulated test signal for transmission to said first terminal end; and

means for determining if the carrier and reduced amplitude signals have been received at said first terminal end.

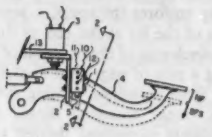
4,170,723

VEHICLE PEDAL HARD BRAKING SWITCH

Funun M. Arsoy, Hatay Cad. No. 621/9, Izmir, Turkey

Filed Apr. 13, 1977, Ser. No. 787,146
Claims priority, application Turkey, Apr. 15, 1976, 33752
Int. Cl.[2] H01H *3/14*; B60Q *1/44*
U.S. Cl. 200—61.89 **2 Claims**

1. In a device for signaling a hard braking of a motor vehicle including electrical switch means for controlling the energization of a hard brake warning light which operates in conjunction with the conventional motor vehicle brake light, actuating means for actuating said electrical switch means, and mounting means for mounting said electrical switch means and said



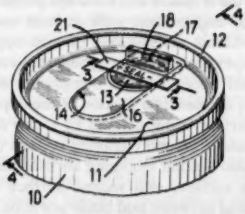
actuating means in operative relationship to the brake pedal of said motor vehicle so as to provide for actuation of said electrical switch means to energize said hard brake warning light when said brake pedal has been depressed by more than a predetermined amount, and said electrical switch means includes an actuating lever, the improvement wherein said actuating means comprises a bracket including mounting means for mounting said bracket on said brake pedal and having an inclined surface thereon adapted to bear against said actuating lever to actuate said switch means upon movement of said brake pedal greater than a predetermined amount, said bracket including means for varying the inclination of said inclined surface thereby to vary the amount of brake pedal movement needed to actuate said switch means.

4,170,724

VENDABLE RECLOSABLE BEVERAGE CONTAINER

Nelson J. Waterbury, Marschall Str. 9, 8 Munich 40, Fed. Rep. of Germany

Continuation of Ser. No. 763,717, Jan. 28, 1977, abandoned. This application Mar. 24, 1978, Ser. No. 889,836
Int. Cl.[2] B65D *43/20, 51/18*
U.S. Cl. 200—346 **3 Claims**



1. A sealed beverage container comprising an upstanding chime around the outer periphery of the upper end of the container, a lid of substantially uniform thickness recessed beneath the upper edge of the chime, an open guideway recessed beneath the upper surface of the lid and extending from the chime at least part way across the upper surface of the lid, a pair of opposite walls depending from the lid along bend lines and defining part of said guideway, a recessed portion of the lid connected by bend lines from the lower ends of the depending

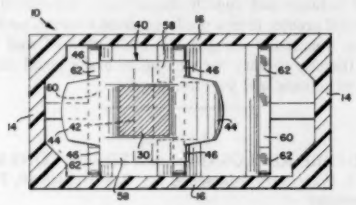
walls and defining both part of the lid and the bottom surface of said recessed guideway, the depending walls of the guideway extending from the inner edge of the upper surface of the lid downwardly and outwardly to the outer edge of the recessed portion of the lid, the lid, depending walls and recessed portion of the lid formed as integral parts of the lid of material of substantially uniform thickness, a pour opening in the recessed portion of the lid at the end of the guideway near the chime for the discharge of the contents of the container, a slide closure having a pair of edges interlocked and slidable within the guideway from a position closing the pour opening to an open position, finger engaging means formed on the slide closure to facilitate movement thereof within the guideway, the thickness of the slide closure within the guideway and the depth of the guideway being substantially equal and including an upper surface of the slide closure which is substantially coplanar with the upper surface of the lid, the upstanding chime defining a concavely curved stop for the slide closure in sealed position with the leading end of the slide closure and the stop surface defined by surfaces of complementary shape across the entire width of the guideway to insure flush engagement of the slide closure with the chime in sealed position, and a frangible seal adhering to and bridging the undersides of the recessed portion of the lid and the undersides of the slidable closure to hermetically seal the opening when the closure is in closed position and to permit breakage of the frangible seal when the slide closure is moved to open position.

4,170,725

SWITCH WITH SLIDING CONTACTOR

Guy M. Farrell, Elmhurst, Ill., assignor to Chicago Switch, Inc., Chicago, Ill.

Filed Apr. 10, 1978, Ser. No. 894,830
Int. Cl.[2] H01H *13/28*
U.S. Cl. 200—676 **7 Claims**



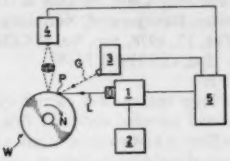
1. In a switch construction wherein opposed contacts are positioned on a base, a sliding bridging contactor, and means for sliding the contactor relative to the base whereby the contactor shifts laterally between a first position completing a circuit between the contacts and a second position whereat the contact is out of engagement with at least one contact, the improvement wherein at least one of said opposed contacts comprises an upper section defining separate contactor engaging surfaces, said upper section comprising a blade, a first engaging surface defined by a portion of the upper section, said first engaging surface being defined by a pair of spaced-apart blade portions, and a second engaging surface defined by said upper section, said second engaging surface being offset relative to the first surface, said second surface comprising an indentation formed between said blade portions, said contactor including a shoulder portion movable into engagement with said first surface and a tab section movable into engagement with said second surface, said tab section moving within said indentation, and said shoulder portion including a pair of shoulders formed on opposite sides of said tab section, each of said shoulders being adapted to be pressed into engagement with respective blade portions, engagment of said shoulders with the blade portions limiting the extent of movement of said contactor relative to said upper section, and wherein the separate engagment of the shoulders and the tab section with said upper section provides separate potential current paths in the construction.

4,170,726

METHOD OF WORKING OUTER PERIPHERY OF ARTICLES WITH LASER LIGHT

Hiroji Okuda, Kitakatsuragigun, Japan, assignor to Koyo Seiko Company Limited, Osaka, Japan

Filed Jan. 20, 1978, Ser. No. 870,996
Claims priority, application Japan, Nov. 15, 1977, 52-137391
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 LM **4 Claims**



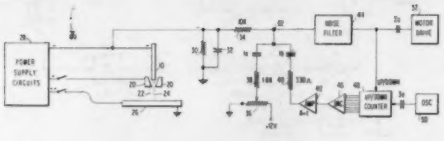
1. A method of working the outer periphery of a workpiece using laser beam, comprising the steps of:
rotating a workpiece;
irradiating the workpiece at a point of irradiation with a laser beam oriented tangential to the workpiece to effect melting the workpiece in the area of irradiation,
removing the melt, and
shifting the point of irradiation in the direction of the axis of rotation of the workpiece.

4,170,727

THERMAL TORCH HEIGHT ACQUISITION CIRCUIT

Raymond Wilkins, Hanover, N.H., assignor to Thermal Dynamics Corporation, West Labanon, N.H.

Filed May 19, 1978, Ser. No. 907,476
Int. Cl.[2] B23K *9/10*
U.S. Cl. 219—121 P **13 Claims**



1. In a plasma torch system of the type wherein a non-transferred arc is generated between a torch cathode and torch tip, and wherein said system further comprises a motor for raising and lowering the torch height above a workpiece, the improvement comprising:
comparator means having first and second inputs and an error signal output, said error signal output being connected to said motor for raising and lowering said torch relative to said workpiece depending upon the magnitude and polarity of said error signal output;
variable control means for applying a selected initial height reference voltage to one input of said comparator; and
means connecting to said second input of said comparator a voltage corresponding to the voltage between said torch cathode and said workpiece during the time when said non-transferred arc is generated, whereby the error output voltage will be nulled when the torch height above the workpiece is a value determined by said selected initial height reference voltage.

4,170,728

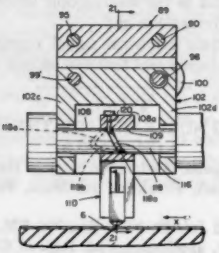
HEAT APPLYING MICROFILM RECORDING APPARATUS

Richard Flasck, Rochester, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jan. 23, 1978, Ser. No. 871,435

Int. Cl.[2] H05B *1/00*

U.S. Cl. 219—216 **22 Claims**



1. A recording head to image selected micro-sized points of heat imageable recording material, said recording head including a heating wire support body having a heating wire-presenting end portion to face said recording material, said end portion of said support body having spaced recesses extending transversely across said end portion to form positioning grooves for fine threads of heating wire material, said support body recesses having outwardly facing edges at the bottom thereof which are to face said recording material, respective insulated fine threads of transversely extending, heating wire material extending along opposite sides of said support body and extending into said recesses, said threads of heating wire material being bent around said edges of the recesses to form micro-sized heat application points to be applied to said recording material.

4,170,729

CONTROL SYSTEMS FOR OR IN ASSOCIATION WITH STORAGE HEATERS

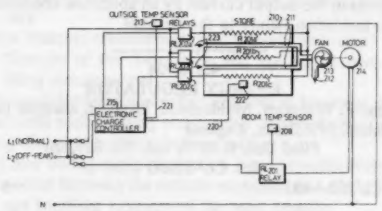
Richard J. Lane, Moddershall, and Gordon Ellis, Stramshall, both of England, assignors to Creda Electric Limited, Stoke-on-Trent, England

Filed Feb. 4, 1976, Ser. No. 655,256

Claims priority, application United Kingdom, Feb. 11, 1975, 5697/75

Int. Cl.[2] H05B *1/02*; F24H *7/02*

U.S. Cl. 219—364 **2 Claims**



1. In a heater having a thermal store, means for establishing flow of a heat distributing fluid into contact with said store and thereafter to a place at which heat is required to be furnished, means for charging said store during an electricity supply off-peak period comprising electrical heating means in thermal communication with said store, and a control circuit for controlling electrical energisation of the heating means during said period, the improvement wherein:

a. said electrical heating means comprises a plurality of heating elements each in thermal communication with said store,

b. said circuit comprises:

i. sensing means for sensing a parameter representative of the state of charge of said store and providing a state of charge electrical signal,

ii. further sensing means for sensing external temperature and providing a weather state electrical signal,

iii. solid state semi-conductor charge controller means connected to said sensing means and to said further sensing means and including, a plurality of output terminals, said charge controller means comprising programming means for initiating charging at a predetermined time in said period in response to the magnitude of said state of charge signal and comparator means responsive to a predetermined magnitude relation between said state of charge signal and said weather signal to establish a charge control signal and to determine the number of said output terminals carrying said charge control signal,

iv. a plurality of current controlling means connected between respective ones of said output terminals and respective ones of said heating elements and responsive to the incidence of said charge control signal at each of said terminals whereby the number of said heating elements energised during said off-peak period is determined by said weather state signal.

4,170,730

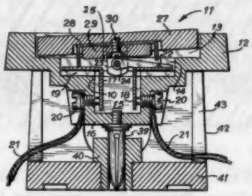
MULTIPLE MODULAR SWITCH AND WALL PLUG

Ramon P. Guendulain, Giorgioni 31-G, Mixcoac, 19 Mexico City, Mexico

Filed Jul. 28, 1977, Ser. No. 820,070

Int. Cl.[2] H01H *23/20*

U.S. Cl. 200—67 F **10 Claims**



1. An electric switch comprising a mounting plate formed with a recess having a bottom surface and with a slot having walls extending downwardly from the bottom surface of the recess, the opposing walls of the slot forming respective steps with the bottom surface of the recess, first and second terminal connection posts projecting into the slot from said opposing walls respectively, and first and second angled plates of electrically conductive material mounted over said steps respectively and each having one portion overlying the bottom surface of the recess and another portion extending into the slot, the other portions of said angled plates being in electrically conductive contact with said terminal connection posts respectively, said first angled plate being formed with two parallel bracket portions projecting from its said one portion in the direction away from said bottom surface of the recess, and the switch further comprising a control block, an electrically conductive connection member secured to the control block and pivotally connected to said bracket portions of the first angled plate whereby the control block is mounted in said recess of the mounting plate so as to be rockable between a first position in which the connection member engages the second angled plate and a second position in which the connection member is electrically insulated from the second angled plate, and magnetic biasing means effective to retain the control block in one of the first and second positions until sufficient force tending to rock the control block to the other position is applied to the control block to overcome the magnetic retaining force exerted by the magnetic biasing means, whereupon the control block rocks to said other position and is retained in that position by the magnetic biasing means until sufficient force tend-

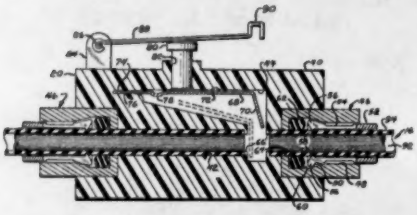
ing to rock the control block to said one position is applied to the control block to overcome the magnetic retaining force exerted by the magnetic biasing means, whereupon the control block rocks to said one position.

4,170,731
FIBER OPTIC CONTROL MODULES AND SYSTEM EMPLOYING THE SAME

Melvyn J. Howell, and Raymond C. Pilch, both of Elmhurst, Ill., assignors to Miller Fluid Power Corporation, Bensenville, Ill.

Filed Aug. 30, 1976, Ser. No. 719,063
Int. Cl.[2] G02B *5/14;* H01J *5/16, 39/12*
U.S. Cl. 250—227 **13 Claims**

1. An optical switch comprising:
- a switch body;
- a passage extending through said body and having a straight line portion within said body;
- a pair of fittings on said body, one at each end of said passage and each including a bore aligned with said passage and selectively operable gripper means disposed within the bore for penetrating and gripping the exterior of an optical fiber bundle inserted in said bore;
- a cavity within said body and intersecting said straight line portion of said passage;
- an opaque mask mounted on said body within said cavity for movement between positions in and out of said straight line portion of said passage;
- an operator on said body for moving said mask between said positions; and

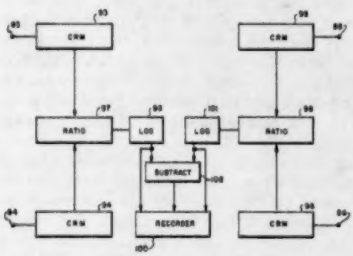


- stop means in said passage on both sides of said cavity and in close adjacency thereto for preventing insertion of an optical fiber bundle into said cavity.

4,170,732
PULSED NEUTRON POROSITY LOGGING METHOD AND APPAPARATUS USING DUAL DETECTORS

Russel R. Randall, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 1, 1977, Ser. No. 829,763
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—264 **9 Claims**

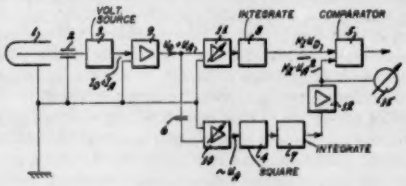


1. A method for determining the fluid-filled porosity of earth formations surrounding a borehole, comprising:
- irradiating said formations with high energy neutrons;
- detecting secondary radiation from said formations at first and second points spaced from the source of said irradiation;
- generating a first electrical signal indicative of the secondary radiation detected at said first point and functionally related to the macroscopic absorption cross section of said formations;
- generating a second electrical signal indicative of the secondary radiation detected at said second point and functionally related to the macroscopic absorption cross section of said formations; and
- generating a third electrical signal representative of the difference between said first and second signals.

4,170,733
MONITORING NUCLEAR RADIATION MEASURING CHANNELS

Harald Weiss, Vienna, Austria, assignor to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,147
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634590
Int. Cl.[2] G01T *1/18;* H01J *39/28;* G01R *31/12*
U.S. Cl. 250—374 **7 Claims**

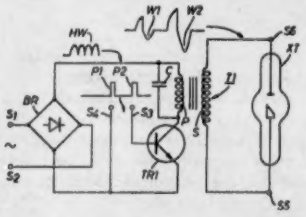


1. Apparatus for continuously monitoring proper functioning of a measuring channel for nuclear radiation furnishing an output current being representative of nuclear radiation as picked up by the measuring channel, comprising:
- first means responsive to the output current and separating from each other DC and AC components thereof;
- second means connected for adjusting at least one of the components to obtain a particular quantitative relationship of the components, for operating conditions of the measuring channel regarded as normal in which said components vary correspondingly to each other upon variation of the picked up nuclear radiation; and
- third means connected to receive the components as adjusted and providing an indication of a deviation from the particular relationship on account of interference in the channel resulting in a change of at least one of the components in the output current by an abnormal condition such as insulation failure in the channel.

4,170,734
ENERGY REGULATOR

Royston F. Woodruff, Maidenhead, England, assignor to E M I Limited, Middlesex, England

Filed Dec. 5, 1977, Ser. No. 857,520
Int. Cl.[2] H05G *1/00*
U.S. Cl. 250—402 **9 Claims**



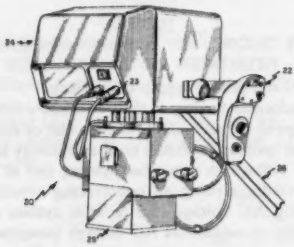
1. X-ray apparatus comprising an input for receiving AC electrical energy; a rectifier for receiving the AC electrical

energy; pulse producing means connected to the rectifier to produce from the unidirectional half-waves of electrical energy supplied thereby unidirectional pulses of electrical energy having controllable durations; control means connected to the pulse producing means to control the durations of the puses; an X-ray tube having the electrical characteristics of a diode; and tube energising means comprising a resonant circuit which is arranged to resonate at a frequency about twice that of the AC electrical energy and which includes a transformer having a primary winding connected to receive the pulses and a secondary winding connected to the X-ray tube, the tube energising means being arranged to store the energy of each pulse in such manner that the voltage applied to the X-ray tube during the storage of the energy of the pulse has a sense in which the X-ray tube is non-conductive, and then to release the stored energy to energise the X-ray tube in its conductive sense, the magnitude of the energy applied to the tube being dependent upon the duration of the pulse applied to the tube energising means.

4,170,735
PORTABLE X-RAY UNIT

Jorge G. Codina, Hartsdale, N.Y.; Weems E. Estelle, Southport, and Gerald J. Stussman, Orange, both of Conn., assignors to General X-Ray Corporation, Southport, Conn.

Filed Jul. 21, 1977, Ser. No. 817,788
Int. Cl.² H05G 1/10
U.S. Cl. 250—422 **36 Claims**

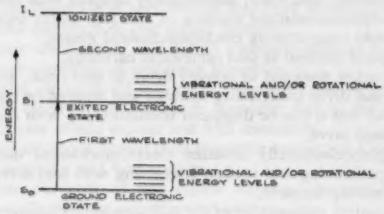


1. A portable X-ray unit comprising
(A) a main housing incorporating
(a) high voltage handling circuitry,
(b) low voltage handling circuitry,
(c) high voltage and low voltage interfacing means,
(d) an X-ray generating tube,
(e) a high voltage transformer conductively connected to the X-ray tube and the high voltage handling circuitry, and
(f) a filament transformer conductively connected to the filament of the X-ray tube and the high voltage handling circuitry; and
(B) a hand-holdable controller operable at locations remote from the main housing and capable of completely controlling the main housing, incorporating
(a) low voltage interconnection means conductively connected between the remote controller and the low voltage handling circuitry of the main housing,
(b) operator controlled switch means for pre-selecting a desired peak kilovolt level,
(c) operator controlled switch means for pre-selecting an exposure time duration,
(d) current level control circuitry for automatically selecting and delivering a fixed filament current level for the particular pre-selected conditions,
(e) display means for visually presenting the product of the automatically determined current level multiplied by the pre-selected exposure time,
(f) informational display means for visually presenting the particular operational state of the main housing, and
(g) operator controlled exposure initiation switch means for controlling the start of the X-ray exposure.

4,170,736
MULTI-PHOTON PHOTOIONIZATION TRACE VAPOR DETECTOR

John E. Wessel, Manhattan Beach, Calif., assignor to The Aerospace Corporation, Los Angeles, Calif.

Filed Nov. 14, 1977, Ser. No. 850,937
Int. Cl.² H01J 27/00
U.S. Cl. 250—423 P **23 Claims**

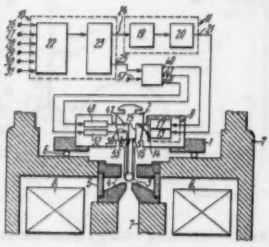


1. A method of detecting and identifying predetermined gaseous molecules wherein the molecules have a plurality of energy states and a predetermined ionized state, and first photon inducible transitions from a first energy state to a second energy state higher than said first energy state, and photon inducible transitions from said second energy state to at least said ionized state, comprising the steps of:
subjecting a gaseous sample containing said predetermined molecules to a first photon beam to induce transitions of at least a portion of said predetermined gaseous molecules from said first energy state to said second energy state;
subjecting said portion of said predetermined gaseous molecules at said second energy state to a second photo beam to induce transitions of at least some of said portion of said predetermined gaseous molucules to said ionized state thereof;
detecting the amount of said ionization; and
generating an information signal having a magnitude proportional to said detected amount of ionization.

4,170,737
TOP-ENTRY TRANSMISSION ELECTRON MICROSCOPE

Gennady N. Bobrov; Mikhail I. Shishkov; Gennady I. Kuzin; Evgeny G. Ivanov, all of Puschino Moskovskoi oblasti, and Igor M. Akimov, Moscow, all of U.S.S.R., assignors to Spetsialnoe Konstruktorskoe Bjuro Biologicheskogo Priborotroenia Akademii Nauk SSSR, U.S.S.R.

Filed Jul. 6, 1978, Ser. No. 922,382
Int. Cl.² G21K 5/06
U.S. Cl. 250—442 **16 Claims**



1. A top-entry transmission electron microscope comprising:
a stage,
a removable cartridge housed in said stage,
a specimen holder mounted in said removable cartridge,
a magnetic lens, in the field of which is located said specimen

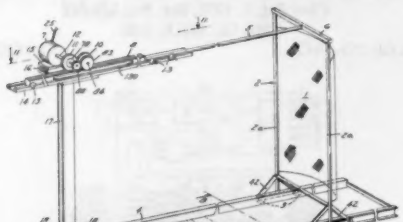
holder mounted so that it can be tilted about the axis x perpendicular to the microscope's optical axis,
an electric drive for said holder mechanically coupled with the latter,
an actuating step motor of said electric drive mounted on said stage,
a rotor of said actuating step motor having the axle coincident with said axis x and mechanically coupled with said specimen holder for the synchronous turning of said rotor and holder,
a piezoelectrically actuated electromechanical means for turning said rotor, mechanically coupled with the latter,
a drive-transmitting member of said step motor secured on said rotor-turning electromechanical means,
a pivot secured in said removable cartridge,
a rocker designed to convey drive to said rotor, geared to said drive transmitting member and secured on said pivot so that it can be displaced translationally with respect to said pivot,
a piezoelectrically actuated electromechanical means for positioning said rocker, interacting with said drive transmitting member,
a control voltage shaper for said step motor having an analogue output joined to said rotor-turning electromechanical means and a count input,
a code-to-voltage converter for said control voltage shaper having an output serving as said analogue output for said control voltage shaper and an input,
a Johnson code distributor for said input of said control voltage converter having an output joined to said input of said code-to-voltage converter,
a unit for setting the magnitude and sense of holder displacement having an output for clock pulses and joined to said count input of said control voltage shaper,
a control unit of said unit for setting the magnitude and sense of holder displacement having inputs, meant for receiving the signals of "start," "stop," "reset," "clock pulse frequency," "sense of displacement," "magnitude of displacement," and an output,
a synchronization unit having an input joined to said output of said control unit, an output for clock pulses joined to said control voltage shaper, and a control output joined to said rocker-positioning electromechanical means.

4,170,738

ENERGY DEVICE POWERED BY THE MOTION OF WATER BENEATH WAVES

E. Quimby Smith, Camarillo, Calif., assignor to Q Corporation, Camarillo, Calif.

Filed Dec. 19, 1977, Ser. No. 861,967
Int. Cl.[2] F03B *13/12*
U.S. Cl. 290—42 **19 Claims**



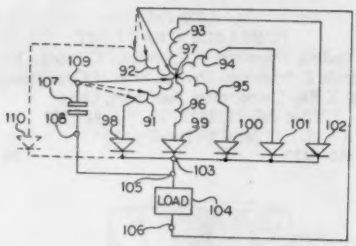
1. Apparatus for extracting energy from the motion of water beneath waves in a body of water comprising a generally upright sail structure capable of being moved by the water, means for supporting said sail structure in said body of water transverse to the direction of water movement with at least a substantial portion thereof beneath the surface of the waves and for guiding the same for generally rectilinear movement in the direction of water movement so that said structure may be reciprocated by the movement of the water beneath the waves, and means operatively connecting said sail structure to a power device, such as an electric generator or pump, to transfer the energy extracted by said sail structure to said power device.

4,170,739

APPARATUS AND METHOD FOR SUPPLYING DIRECT CURRENT WITH SUPERIMPOSED ALTERNATING CURRENT

Boruch B. Frusztajer, 15 Oakland St., Lexington, Mass. 02173, and Moisey M. Lerner, 1788 Beacon St., Brookline, Mass. 02146

Filed Dec. 23, 1977, Ser. No. 864,001
Int. Cl.[2] H02J *5/00*
U.S. Cl. 307—2 **17 Claims**



1. A DC+AC power supply comprising:
(a) a transformer having at least two star-connected phase windings in the secondary, at least one of these windings being an ordinary winding used exclusively for supplying an AC voltage to a rectifier system, and at least one of these windings being an unbalancing winding used for supplying AC voltage to a rectifier system and also for providing an additional AC voltage component across a load;
(b) a rectifier system having at least two rectifier circuit elements, each circuit element having two terminals, one terminal being connected to any phase-winding of the secondary of the transformer, the other terminal being connected to a first output terminal, all rectifier circuit elements having the same direction with respect to said first output terminal, whereby each of the phase-windings is connected to a corresponding rectifier circuit element;
(c) a load having a first and a second terminal, the first load terminal being connected to the first output terminal, and the second load terminal being connected to any point of the unbalancing winding, said point being different from the point of star connection of transformer windings, whereby an additional AC voltage component is introduced across the load, said AC voltage being superimposed on a DC voltage across said load.

4,170,740

HIGH VOLTAGE SWITCH AND CAPACITIVE DRIVE

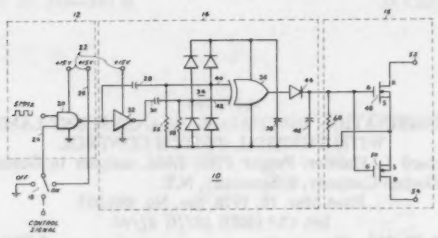
Joseph Pernyeszi, Fairfield, Conn., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Feb. 24, 1978, Ser. No. 880,833
Int. Cl.[2] H03K *17/16, 17/60*
U.S. Cl. 307—251 **15 Claims**

1. A solid state switch comprising:
input logic means for selectively coupling an input voltage to an output of said input logic means at a predetermined frequency;
means for capacitively coupling said predetermined frequency voltage from said input logic means to a pair of

logic inputs, such that said predetermined frequency voltage on one of said logic inputs is out of phase with the other of said predetermined frequency voltage on the other of said logic inputs;

gate means coupled to said logic inputs and responsive to the voltages on said logic inputs and having an output when the voltages on said logic inputs are out of phase; and



switching means coupled to and responsive to the output of said gate means for providing either a high voltage output or a low resistance conductive path at the output thereof, in accordance with the output of said gate means, such that said high voltage output is electrically isolated from said input logic means.

4,170,741

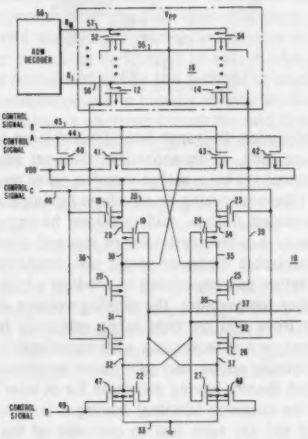
HIGH SPEED CMOS SENSE CIRCUIT FOR SEMICONDUCTOR MEMORIES

David W. Williams, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 13, 1978, Ser. No. 885,821

Int. Cl.[2] H03K *5/20, 3/353;* **G11C** *7/00, 11/40*

U.S. Cl. 307—355 **5 Claims**



1. A CMOS memory sense circuit for comparing a first and second voltage comprising:

first through tenth field effect transistors each having a gate, source and drain electrode,

said first through fourth and said sixth through ninth transistors having a P-type channel,

said fifth and tenth transistors having an N-type channel,

the source electrode of said first and sixth transistors coupled to the positive terminal of a first voltage supply,

the drain electrode of said first transistor coupled to the source electrode of said second transistor,

the drain electrode of said second transistor coupled to the source electrode of said third transistor,

the drain electrode of said third transistor coupled to the source electrode of said fourth transistor,

the drain electrode of said fourth transistor coupled to the drain electrode of said fifth transistor and to the gate electrode of said seventh and tenth transistors,

the source electrode of said fifth and tenth transistors coupled to the negative terminal of said first voltage supply,

the drain electrode of said sixth transistor coupled to the source electrode of said seventh transistor,

the drain electrode of said seventh transistor coupled to the source electrode of said eighth transistor,

the drain electrode of said eighth transistor coupled to the source electrode of said ninth transistor,

the drain electrode of said ninth transistor coupled to the drain electrode of said tenth transistor and to the gate electrode of said second and fifth transistors,

the gate electrode of said third transistor coupled to a means for applying said first voltage,

the gate electrode of said eighth transistor coupled to a means for applying said second voltage,

first through fourth control signals,

first means coupled and responsive to said first control signal for coupling the gate electrode of said third and eighth transistors to said positive terminal of said first voltage supply,

second means coupled and responsive to said second control signal for coupling the source electrode of said third transistor to the gate electrode of said eighth transistor,

third means coupled and responsive to said second control signal for coupling the source electrode of said eighth transistor to the gate electrode of said third transistor,

the gate electrode of said first, fourth, sixth and ninth transistors coupled to said third control signal for controlling the conduction of said first, fourth, sixth and ninth transistors, and

fourth means coupled and responsive to said fourth control signal for coupling the drain electrode of said fourth and ninth transistors to the negative terminal of said first voltage supply.

4,170,742

PIEZOELECTRIC TRANSDUCER WITH MULTIPLE ELECTRODE AREAS

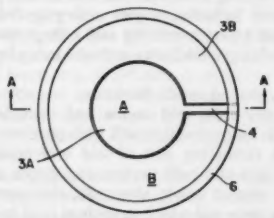
Tadasi Itagaki; Kiyonori Iwama, and Toshikazu Yoshimi, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo and Tokorozawa Electronic Corporation, Tokorozawa, both of, Japan

Division of Ser. No. 595,631, Jul. 14, 1975, Pat. No. 4,045,695. This application Aug. 5, 1977, Ser. No. 822,061

Claims priority, application Japan, Jul. 15, 1974, 49/81287; May 30, 1975, 50/64932

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—324 **9 Claims**



1. A piezoelectric electro-acoustic transducer comprising:

a flexible diaphragm including a flexible piezoelectric film fixedly supported at the periphery thereof, a first electrode on one side of said flexible piezoelectric film, and a

plurality of second electrodes on the other side of said flexible piezoelectric film and confronting said first electrodes through said film, two said second electrodes on said other film side being spaced from each other and being arranged for electrical connection separately, said two second electrodes occupying two discreet areas on said film;

a resilient backing member backing said flexible diaphragm and supporting same in a nonplanar rest shape while imparting a limited and differing degree of stiffness to said two second electrode areas, said resilient backing member comprising two portions of different resiliencies which confront and support said two second electrode areas respectively, said two resilient backing member portions having geometric outlets substantially conforming to the outlines of the respective two said second electrodes, said two resilient backing member portions so differing from each other in structure as to impart different time constants to said two second electrode areas respectively, said transducer having a frequency range in which one of said two second electrode areas on said film is the more effective for frequencies in the lower part of said range and the other of said two second electrode areas on said film is the more effective for frequencies in the upper part of said range.

4,170,743

HIGH-CURRENT, LOW PRESSURE, MERCURY DISCHARGE LAMP WITH PRESSURE COMPENSATION SPACE

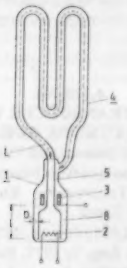
Hans Notz, Dietikon, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jun. 23, 1978, Ser. No. 918,428

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1978, 2814683

Int. Cl.[2] H01J *61/067, 61/10, 61/20, 61/30*

U.S. Cl. 313—204 **3 Claims**



1. A high-current mercury low pressure lamp with a pressure compensation space, comprising:

an envelope having a bulb portion and an arm portion, said arm portion including a part emerging from the bulb portion and a part reentering said bulb portion, said arm portion defining a discharge path and being light transparent;

an annularly shaped anode electrode;

a cathode electorde, said anode and cathode electrodes disposed in tandem within said bulb portion;

wherein the reentering part of said arm portion projects coaxially into said bulb portion and passes through said annularly shaped anode electrode, said reentering part having an open end which extends at least to the cathode electrode to surround the cathode electrode laterally such that said cathode electrode is within said reentering part, said cathode electrode communicating with said anode electrode through said open end of said reentering part and through an intermediate space betwen said bulb portion and said reentering part;

wherein said intermediate space serves as said pressure compensation space.

4,170,744

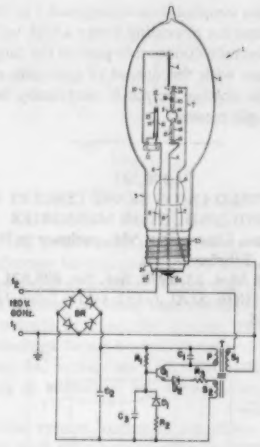
COMBINATION DISCHARGE-INCANDESCENT LAMP WITH THERMAL SWITCH CONTROL

Richard L. Hansler, Pepper Pike, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 10, 1978, Ser. No. 885,313

Int. Cl.[2] H05B *39/10, 41/46*

U.S. Cl. 315—90 **5 Claims**



1. A combination discharge-incandescent lamp comprising a miniature arc tube, an incandescible filament and a thermal switch mounted within a sealed vitreous outer envelope,

said arc tube comprising an envelope having a pair of electrodes sealed therein, said envelope having a discharge volume of 1 cubic centimeter or less and containing a fill of vaporizable metal or metal salt condensed at room temperature and vaporizing to produce a high pressure at operating temperature, the striking voltage and the light output from said arc tube being relatively low at room temperature and increasing with vaporization of said fill,

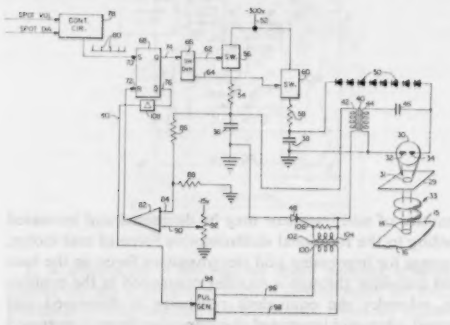
current inleads sealed into said outer envelope and a base attached thereto having provision for at least three terminals, one common terminal having a connection to one side of the arc tube and to one side of the filament, a second terminal having a connection to the opposite side of the arc tube, and a third terminal having a connection to the thermal switch, said thermal switch being connected to the other side of said filament,

said thermal switch being normally closed and being located in heat-receiving proximity to said arc tube, said thermal switch being biased to open only when said arc tube approaches its normal operating temperature whereby a dynamic heat balance is achieved which allows the switch to cool and reclose quickly in the event of extinction of the arc tube upon a momentary interruption of current thereto.

4,170,745
LAMP FLASHING CIRCUIT FOR LINE GENERATING PHOTOEXPOSURE DEVICE

Leonard G. Rich, West Hartford, and Henry F. Berdat, Manchester, both of Conn., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Dec. 27, 1977, Ser. No. 864,601
Int. Cl.[2] H05B *41/34*
U.S. Cl. 315—241 R **11 Claims**



1. A lamp flashing circuit for a photoexposure device operable to expose a line on a photosensitive surface by repeatedly projecting spots of light onto the surface as the locus of the spots is moved relative to the surface along the line to be exposed, said lamp flashing circuit comprising: a gas filled flash lamp with an anode and a cathode, a source of charging voltage, a firing capacitor, a discharge circuit including said flash lamp connected across said firing capacitor for discharging said firing capacitor through said lamp to create a flash when an ionized path exists between said anode and cathode, a triggering capacitor, a triggering circuit connected across said triggering capacitor and coupled with said flash lamp for discharging said triggering capacitor in response to a trigger pulse and for producing as a result of said discharge a high voltage pulse across said anode and cathode to create an ionized path therebetween and to thereby initiate the discharge of said firing capacitor, a charging circuit for said firing capacitor, a charging circuit for said triggering capacitor, a source of repetitive flash cycle initiate pulses, means operable in response to each of said flash cycle initiate pulses for simultaneously connecting said two charging circuits to said source of charging voltage, a comparator for comparing the voltage across said triggering capacitor with a given reference voltage, and means responsive to said comparator for simultaneously disconnecting said two charging circuits from said source of charging voltage and for producing a trigger pulse supplied to said triggering circuit to cause said discharging of said triggering capacitor when said voltage across said triggering capacitor reaches comparison with said given reference voltage.

4,170,746
HIGH FREQUENCY OPERATION OF MINIATURE METAL VAPOR DISCHARGE LAMPS

John M. Davenport, Lyndhurst, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,578
Int. Cl.[2] H05B *41/16, 41/24*
U.S. Cl. 315—246 **18 Claims**

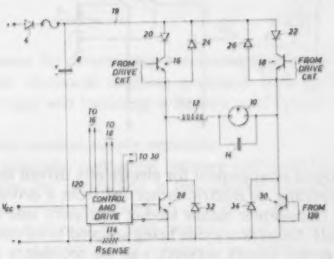
1. A method of operating a miniature high pressure metal vapor discharge lamp having a pair of electrodes and a discharge volume not exceeding approximately 1 cubic centimeter, which consists in applying an alternating voltage across said electrodes at a frequency in a resonance-free region located above 20 and below 50 kilohertz in order to be beyond

the audible range but below the range of excessive electromagnetic interference.

4,170,747
FIXED FREQUENCY, VARIABLE DUTY CYCLE, SQUARE WAVE DIMMER FOR HIGH INTENSITY GASEOUS DISCHARGE LAMP

Kenneth P. Holmes, Austin, Tex., assignor to Esquire, Inc., New York, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,730
Int. Cl.[2] H05B *41/38; G05F 1/08*
U.S. Cl. 315—307 **9 Claims**



1. A dimmer circuit connectable to a dc voltage source for applying a constant frequency, variable duty voltage to a high intensity discharge lamp, a change in the ratio of applying voltage from the dc source compared to the overall period of applying such voltage and a greatly reduced voltage providing a range of dimming currents to the lamp, comprising

an inductor in series with the lamp,

a dual switching circuit connected to the lamp and inductor including

a pair of transistor networks alternatively and complementarily conducting, thereby directing current from the dc voltage source in opposite directions through the lamp at a low frequency,

a first electronic on-off switch connected alternatively to provide and to deny the voltage from the source to the lamp during the time the first of said pair of transistor networks is conducting, at a high frequency rate,

a second electronic on-off switch connected alternatively to provide and to deny the voltage from the source to the lamp during the time the second of said pair of transistor networks is conducting, at the same high frequency rate,

first and second timer means connected respectively to said first and second switches, each said first and second timer means being connected to a constant-frequency, cycle-initiating signal at a high frequency,

current sensing means connected for receiving a current which passes through one of said first and second switches and through the lamp when one of said first and second switches is on, and

voltage triggering means connected to said current sensing

means and to a preset voltage level for producing a cycle terminating signal to each said first and second timer means, a predetermined preset voltage level producing a terminating signal dependent on the time the resulting current flow through the lamp reaches a predetermined level,

said inductor maintaining reduced current flow at the greatly reduced voltage through the lamp following the occurrence of the terminating signal and before the occurrence of the succeeding cycle-initiating signal.

4,170,748

CIRCUIT ARRANGEMENT FOR ELECTRICALLY DRIVEN MOTOR VEHICLES

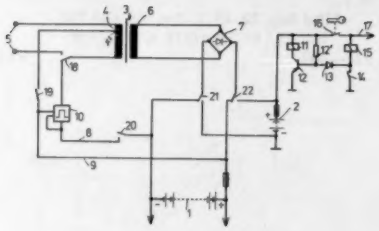
Karl Kapfhammer, Germering, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 1, 1978, Ser. No. 929,958

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2735809

Int. Cl.² H02P 5/00

U.S. Cl. 318—139 **8 Claims**



1. A circuit arrangement for electrically driven motor vehicles, comprising an electric motor fed from a driving battery means, a transformer means having a primary side and a secondary side, the primary side being adapted to be connected to an A.C. power supply network and the secondary side being adapted to be connected to the driving battery means by way of rectifier means, and a D.C. converter means including a vibrator means, an A.C. voltage step-down means and rectifier means, the D.C. converter means being operable to recharge a power supply battery means having a rated voltage lower in comparison to that of the driving battery means, from the driving battery means, characterized in that the transformer means forms the A.C. voltage step-down means, the driving battery means being operatively connected to one side of the transformer means by way of the vibrator means and the power supply battery means having a correspondingly matched stepped-down ratio being operatively connected to the other side of the transformer means by way of the rectifier means.

4,170,749

SPEED CONTROL CIRCUIT FOR A SERIES MOTOR

Katsuji Soeda, Sukagawa, Japan, assignor to Yamamoto Electric Industrial Co., Ltd., Sukagawa, Japan

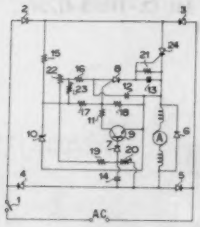
Filed Aug. 22, 1977, Ser. No. 826,650

Claims priority, application Japan, Sep. 16, 1976, 51-111030

Int. Cl.² H02P 5/16

U.S. Cl. 318—331 **4 Claims**

1. A speed control circuit for a series motor comprising a thyristor means for controlling electric current supplied to said series motor, said thyristor means disposed between the output terminals of a full wave rectifying circuit and connected in series with said series motor; a trigger signal generating means for providing a gate signal to a base of said thyristor means; a transistor connected in parallel with said trigger signal generating means to control the break over voltage of said signal generating means, a Zener diode connected across one of said output terminals and the emitter of said transistor and also connected to the gate of said trigger signal generating means for producing a clipped trapezoidal voltage waveform to said gate of said trigger signal generating means, and connecting means for connecting said transistor with said series motor in order that the equivalent resistance between the collector and



the emitter of said transistor may be decreased and increased according to the rotational electromotive force of said motor, and means for impressing said electromotive force on the base of said transistor through a rectifier connected in the positive sense, whereby the equivalent resistance is decreased and increased when said impressed electromotive force is increased and decreased respectively.

4,170,750

ELECTRIC VEHICLE TRACTION MOTOR CONTROL

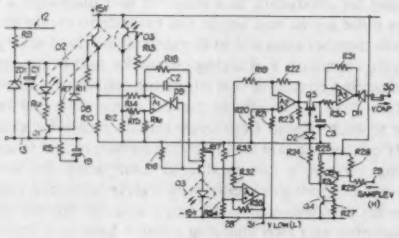
John F. Joyes, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 7, 1978, Ser. No. 884,102

Claims priority, application United Kingdom, Mar. 9, 1977, 9841/77

Int. Cl.² H02P 5/12

U.S. Cl. 318—345 C **7 Claims**



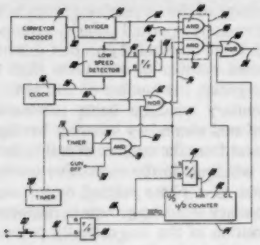
1. An electric vehicle traction motor control circuit comprising a main thyristor in series with the motor armature between a pair of supply rails, a second thyristor arranged on firing to divert current from the main thyristor into a commutating capacitor, a third thyristor connected in series with an inductor across the commutating capacitor and arranged on firing to reverse the polarity of the voltage on the commutating capacitor, driver operable control means for generating a current demand signal and deriving therefrom upper and lower motor current limits, first firing control means for firing the main thyristor when the actual motor current is less than said lower limit, second firing control means for firing the second thyristor when the actual motor current exceeds the upper limit and third firing control means sensitive to the cessation of flow of current into the commutating capacitor for firing the third thyristor when such current flow ceases, thereby ensuring polarity reversal of the voltage on the commutating capacitor before the next commutation time.

4,170,751

ELECTRONIC CONTROL FOR A MECHANIZED SPRAY PAINTING SYSTEM

Ira J. Stricker, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 2, 1978, Ser. No. 874,487
Int. Cl.[2] G05B 9/02
U.S. Cl. 318—563 1 Claim



1. A control for a mechanized spray painting system, the system having a conveyor subject to stoppages for carrying workpieces to be painted, a programmed robot for repeatedly traversing a spray gun across a workpiece surface and beyond, the robot having a conveyor speed input and including programmed control means to normally operate the robot in a set sequence at a rate and position dependent on the conveyor speed and synchronized with workpiece position, said programmed control means operative to develop a gun signal to turn on said spray gun before said gun is directed toward the workpiece surface and to turn off said gun when it is directed away from the surface to be painted, a conveyor speed encoder for supplying to the conveyor speed input an electrical conveyor speed signal having a pulse frequency proportional to conveyor speed, and means for modifying the frequency of the signal delivered to the speed input during conveyor stopping and starting comprising

a low speed detector responsive to the said conveyor speed signal for sensing a preset low speed of said conveyor indicative of impending conveyor stoppage and issuing a corresponding low speed signal,

means including gate means responsive to the low speed signal for supplying to the speed input of said robot a clock frequency representing a speed higher than the preset low speed to maintain a substantially normal spray gun traverse rate during conveyor coastdown,

clock frequency termination timer means responsive to the said gun signal and to a signal having a predetermined time duration for terminating the clock frequency to the speed input of said robot when the spray gun is turned off and after a period sufficient for conveyor stoppage has elapsed, thereby allowing the programmed sequence of the spray gun to continue a small amount after the conveyor stops and causing the spray gun to stop where it is directed away from the surface of the workpiece,

an up/down counter enabled by the low speed signal for counting in one direction from an initial state the pulses of the clock frequency supplied to the speed input of said robot,

means responsive to conveyor start-up for resetting the low speed detector to terminate the low speed signal and causing the up/down counter to count the pulses of the conveyor speed signal in the other direction, and

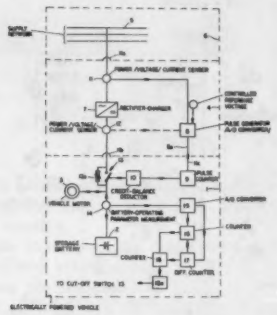
further means responsive to conveyor start-up for inhibiting the supply of the conveyor speed signal to the speed input of said robot until the counter returns to its initial state whereby the conveyor returns toward normal speed and the workpiece advances while the spray gun is idle to substantially synchronize the workpiece position with the spray gun pattern whereupon the robot continues its set sequence at the rate dictated by the conveyor speed.

4,170,752

SYSTEM FOR DETERMINING AND CALCULATING THE WORK DONE BY A MOBILE ELECTRICAL MACHINE AT AN ENERGY SUPPLY STATION

Heinrich Busch, Wesel, and Eberhard Zander, Kirchhellen, both of Fed. Rep. of Germany, assignors to GES Gesellschaft fur Elektrischen Strassenverkehr mbH, Dusseldorf, Fed. Rep. of Germany

Filed Sep. 16, 1977, Ser. No. 833,995
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1976, 2641806
Int. Cl.[2] H02J 7/00
U.S. Cl. 320—44 11 Claims



1. A system for determining and accounting for the service of a mobile electrical machine provided with an electrical energy storage unit including a battery, said system comprising:

an electric-current supply network;

a pulse generator connected between said network and said machine for generating a time-spaced sequence of accounting pulses representing at least the value of electrical energy delivered to said machine, said pulse generator being constructed and arranged to delliver a train of pulses of a cadence corresponding to a variable electric tariff;

a pulse counter connected to said pulse generator for counting pulses derived from said pulse generator over a time interval corresponding to that for which said machine is connected to said network;

evaluating means on said machine responsive to the count of said counter and connected thereto for registering the value at least of electrical energy supplied to said machine; and

a current supply path connecting said network to said energy-storage unit and including a battery charger, said evaluating means including a deductor, said deductor being a credit-balance deductor settable to a predetermined value from which a value corresponding to the count in said counter is deducted during the charging of said battery.

4,170,753

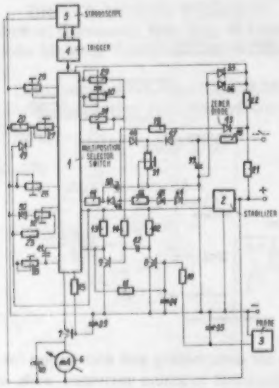
DIAGNOSTIC EQUIPMENT FOR THE INTERNAL COMBUSTION, CARBURETOR TYPE ENGINES

Stanislaw Michalski, and Marian Fabrycy, both of Warsaw, Poland, assignors to Przemyslowy Instytut Automatyki i Pomiarow "MERA-PIAP, Warsaw, Poland

Continuation of Ser. No. 770,317, Feb. 18, 1977, abandoned.
This application Jul. 6, 1978, Ser. No. 922,584
Claims priority, application Poland, Feb. 27, 1976, 187568
Int. Cl.[2] F02P 17/00
U.S. Cl. 324—384 4 Claims

1. Diagnostic apparatus for internal combustion, carburetor type engines, comprising: a meter 6, a probe 3, a stroboscope 5 and trigger 4, change-over switch means 1 for selecting the

desired type of diagnosis operation, a transistor **7**, the meter **6** being connected to the collector of the transistor **7**, the emitter of the transistor **7** being connected to the switch means **1**, a resistor **15** connecting the switch means to the base of the transistor **7**, a monostable element including transistors **8** and **9** having an output connected to said resistor, a resistor **17** in a circuit for testing peak voltage, rheostats **34**, **30**, **29**, **25**, **32**, **26**, **27** and **28** connected to said switch means, said switch means also being connected to the trigger **4** of the stroboscope **5**, a stabilizer **2** connected to said switch means **1**, a capacitor **24** connected to the base of transistor **8**, a resistor **10** connecting the probe **3** to the base of transistor **8**, a capacitor **35** connected to the base of transistor **8** such that the resistor **10**



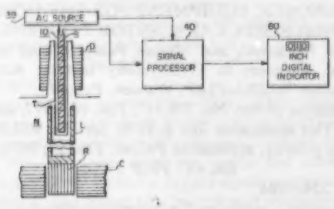
and the capacitors **24** and **35** form an integrator circuit, a resistor **14** connected to the base of transistor **9**, the rheostats **29**, **30** and **34** being connected in parallel to the resistor **14**, a diode **46** connected in series with resistor **17**, a resistor **16** and two diodes **44** and **45** connected in series with diode **46**, two push-pull diodes **47**, **48**, the diode **48** being connected to the switch means **1**, a resistor **18** connecting diode **4** to contact breaker points of the engine, a connector connecting the junction between resistor **17** and diode **46** and the junction between diodes **47** and **48**, a capacitor **38** and rheostat **31** connected in series in said connector, a Zener diode having an output connected to the contact breaker points, and a resistor **19** connecting the input of the Zener diode to the junction between diode **46** and resistor **16**.

4,170,754

PHASE ENCODED DIGITAL POSITION PROBE ASSEMBLY

Johannes J. Schmitz, Catonsville, Md., and Theodore M. Heinrich, Franklin Township, Cambria County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 16, 1975, Ser. No. 622,917
Int. Cl.[2] G21C *17/00*
U.S. Cl. 324—208 **3 Claims**



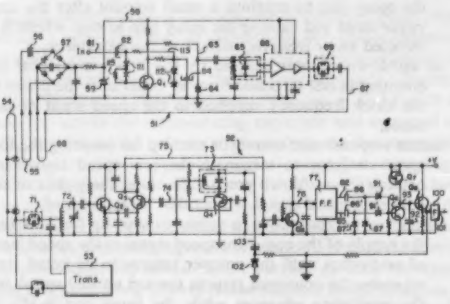
2. A digital probe assembly for monitoring the level or position of a magnetically permeable material, comprising, an elongated probe member consisting of a plurality of core sections aligned in an end-to-end relationship, each core section having coil turns forming a primary and secondary winding thereabout to form a transformer, the voltage signal induced in said secondary winding in response to AC excitation of said primary winding and in response to magnetic coupling and decoupling produced by the presence and absence respectively of a magnetically permeable material in a position adjacent to said respective transformers, said secondary windings being divided to form several groups of secondary windings, the secondary windings of the respective groups being series connected in an alternately opposed polarity arrangement, an end winding in each series connected group of secondary windings having a different number of coil turns than the remaining windings of the group, the number of coil turns in each of the remaining secondary windings being substantially identical, the inclusion of said secondary winding having a number of coil turns different from the number of coil turns of the remaining secondary windings in the respective groups resulting in the development of a phase related output signal from the respective secondary winding groups in response to change in the level or position of the magnetically permeable material, and signal processing circuitry connected to said groups of secondary windings for processing said phase related output signals developed by the respective groups of secondary winding to produce a digital indication of the position or level of said magnetically permeable material, said signal processing circuitry including separate signal processing channels operatively connected to each of said groups of secondary windings, each of said signal processing channels including a square wave reference source for developing a first square wave output and a second square wave output which is the compliment of the first square wave output, a phase splitter circuit means for splitting the output signal developed by the groups of secondary windings into opposite polarity AC signal components, a phase detector circuit means responsive to the output signals of said reference square wave source and said phase splitter circuit means to develop output signal corresponding to the phase relationship between the output signals of said square wave reference source and said phase splitter circuit means, and an integrator circuit means for averaging the output signals developed by said phase detector circuit means to develop a logic level output indicative of the polarity of the output signal of said phase detectors circuit means.

4,170,755

FM TRANSMITTER AND RECEIVER FOR USE WITH NON-DESTRUCTIVE TESTING APPARATUS INCLUDING A MOVEABLE HEAD

Sven E. Mansson, Hollviksnas, Sweden, assignor to Magnetic Analysis Corporation, Mount Vernon, N.Y.

Filed Aug. 24, 1977, Ser. No. 827,228
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—238 **3 Claims**



1. In an apparatus for the non-destructive testing of objects, said apparatus having a moving head moving relative to the object and transducer means mounted thereon for producing

test signals corresponding to variations in an object under test, the improvement comprising;

a. an FM transmitter mounted on said moving head for transmitting a frequency modulated signal modulated in accordance with said test signals,

b. an FM receiver stationary with respect to said moving head for receiving said frequency modulated signals,

c. demodulation means in said FM receiver including a toggle flip-flop supplied with a frequency modulated signal corresponding to the received frequency modulated signal,

d. said flip-flop being designed and adapted to change state when the input thereto passes a threshold level in a predetermined polarity direction and yield a corresponding rectangular wave output,

e. means responsive to said rectangular wave for producing short pulses at predetermined edges thereof;

f. a sawtooth wave generator means supplied with said short pulses for producing sawtooth waves of predetermined slope having amplitudes and durations proportional to the periodicity of the pulses,

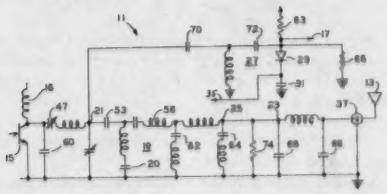
g. and means responsive to said sawtooth waves for producing an output indicating variations in the object under test.

4,170,756

VERSATILE TRANSCEIVER COUPLING NETWORK

Michael E. Shepperd, Indianapolis, Ind., assignor to General Aviation Electronics, Inc., Indianapolis, Ind.

Filed Apr. 18, 1977, Ser. No. 789,333
Int. Cl.[2] H04B *1/40*
U.S. Cl. 325—21 **6 Claims**



1. A network for connecting a receiver and a transmitter to a common antenna to utilize the antenna for both transmit and receive modes of operation comprising:

means coupling the transmitter output to the antenna at least during the transmit mode of operation including a portion of a printed circuit board;

a first junction point on the printed circuit board for coupling the antenna to the receiver input;

a second junction point on the printed circuit board distinct from the first junction point for coupling the antenna to the receiver input, the first and second printed circuit junction points being disposed intermediate the transmitter output and the antenna;

means connected directly to only one of the first and second junction points to couple the receiver input and the antenna at least during the receive mode of operation including means for inhibiting the application of the transmitter output signal to the receiver input during the transmit mode of operation; and

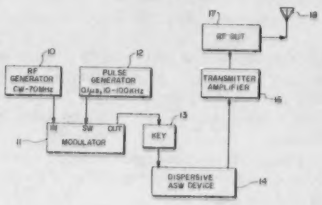
a third terminal on the printed circuit board permanently coupled to the transmitter output, the third terminal permanently connected to the second printed circuit junction point only if the receiver input is coupled to the first printed circuit junction point whereas if the receiver input is coupled to the second printed circuit junction point only during the receive mode of operation then the third terminal of the printed circuit board is connected to the second printed circuit board junction point only during the transmit mode of operation.

4,170,757

METHOD OF AND APPARATUS FOR TRANSMITTING CLANDESTINE RADIO SIGNALS

William J. Skudera, Matawan; Charles M. De Santis, Neptune, both of N.J., and Kurt Ikrath, deceased, late of Elberon, N.J. (by Gertrude Ikrath, executrix), assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 30, 1977, Ser. No. 865,826
Int. Cl.[2] H04K *1/00*; H04B *15/00*
U.S. Cl. 325—32 **9 Claims**



1. A method of transmitting clandestine signals from a first to a second location which comprises the following steps:

at said first location,

(a) amplitude modulating the output of a first continuous wave oscillator with a periodic pulse train;

(b) dispersing the frequency spectrum of said modulated output in a first acoustic surface wave device;

(c) pulse modulating the input to said acoustic surface wave device with the signal to be transmitted;

(d) transmitting said dispersed spectrum to said second location, and

at said second location,

(e) mixing the incoming signal from said first location with the output of a second continuous wave oscillator having the identical frequency as said first continuous wave oscillator;

(f) applying the resultant IF signal to a second acoustic surface wave device to contract and restore the pulse modulated signal spectrum, said spectrum includng noise and pulse levels above said noise;

(g) detecting the output pulses from said second acoustic surface wave device exceeding said noise levels to recover the clandestine signal from the noise; and

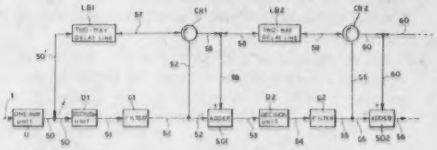
(h) applying the signal output to an output device.

4,170,758

PROCESS AND DEVICE FOR THE NONLINEAR EQUALIZATION OF DIGITAL SIGNALS

Giovanni Tamburelli, Turin, Italy, assignor to CSELT—Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jun. 23, 1977, Ser. No. 809,450
Claims priority, application Italy, Jun. 25, 1976, 68561 A/76; Sep. 30, 1976, 69333 A/76; Feb. 20, 1977, 67417 A/77
Int. Cl.[2] H04B *1/10*; H03K *5/159*
U.S. Cl. 325—42 **2 Claims**



1. An equalizer for eliminating the effects of postcursor and precursor interference from a train of incoming digital signals, comprising:

receiving means connected to a transmission path carrying said incoming signals;

first threshold means connected to said receiving means for converting a given incoming signal into a first decided pulse having one of several predetermined signal levels;

filter means connected to said first threshold means for deriving from said first decided pulse a feedback pulse adapted to correct postcursor interference and a feed-forward pulse adapted to compensate for precursor interference;

first summing means inserted between said receiving means and said threshold means for algebraically combining said feedback pulse with a subsequent incoming signal;

second summing means having an input connected to said filter means for receiving said feed-forward pulse therefrom;

delay means connected to said receiving means for enbling an algebraic combination of said given signal with a concurrently arriving feed-forward pulse derived by said first threshold means and said filter means from said subsequent signal;

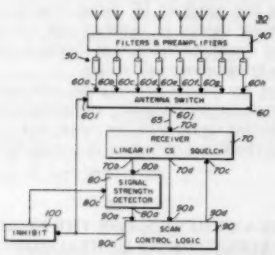
second threshold means connected to said second summing means for converting an output pulse of the latter into a second decided pulse; and

a circulator with an input connection to said filter means, an input/output connection to said delay means and an output connection to said second summing means for delivering said feedback pulse from said filter means to said first summing means and said given signal from said delay means to said second summing means.

4,170,759
ANTENNA SAMPLING SYSTEM

James R. Stimple, Hoffman Estates, and Paul M. Erickson, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1977, Ser. No. 792,942
Int. Cl.[2] H04B 1/06
U.S. Cl. 325—51 **3 Claims**



1. A radio frequency communication system comprising:

a sectored antenna means having a plurality of sectors, each sector predeterminedly oriented with respect to the remaining sectors;

an antenna switch means having a plurality of input terminals, a control terminal, and an output terminal and further including means responsive to control signals at the control terminal to couple a selected input terminal to the output terminal;

antenna coupling means for coupling each antenna sector to a predetermined input terminal of the antenna switch means;

receiver means adapted for receiving radio frequency signals;

receiver coupling means for coupling the antenna switch means output terminal to the receiver means;

detector means for processing the output of the receiver means and detecting the levels of the signals thereat;

control logic means responsive to said detector means for generating and applying predetermined control signals to said antenna switch means to cause predetermined switching of the antenna sectors in response thereto; and

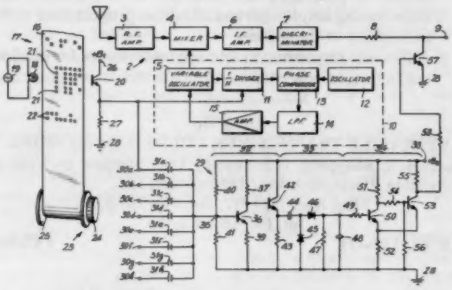
inhibit means for inhibiting operation of the detector means for a predetermined time interval following each instant of antenna switching,

whereby the control logic means is pevented from responding to spurious responses caused by the antenna switching.

4,170,760
RADIO RECEIVER WITH FREQUENCY SELECTION AND MUTING

Kaoru Umeda, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,783
Claims priority, application Japan, Jun. 4, 1977, 52/65997
Int. Cl.[2] H04B 1/10
U.S. Cl. 325—456 **16 Claims**



1. In a radio receiver having demodulation means including a controllable local oscillator and a mixer for demodulating a radio signal in response to the output of said local oscillator, a control means comprising:

a reading assembly including a light source, and a plurality of light sensitive elements each adapted to receive light produced by said light source;

a record medium disposed to influence the light passing from said source to said light sensitive elements and being generally of a material adapted to allow a predetermined first amount of light to pass from said source to said light sensitive elements, said record medium having coded frequency selection information recorded thereon at successive locations in the form of respective groupings of spots each adapted to allow a predetermined second amount of light to pass from said source to a respective one of said light sensitive elements when the respective grouping of spots is aligned with said reading assembly, each of said spots further allowing a respective one of said light sensitive elements to receive an amount of light intermediate said first and second amounts when the respective grouping of spots is not in proper alignment with said reading assembly;

means for moving said record medium relative to said reading assembly in the direction in which said groupings of spots are successively arranged, thereby to selectively align said groupings with said reading assembly;

means responsive to the reception of said second amount of light by at least one of said light sensitive elements when a selected one of said groupings is aligned with said reading assembly for controlling said local oscillator in correspondence with the coded frequency selection information represented by said one selected grouping;

means responsive to the reception of said intermediate amount of light by at least one of said light sensitive elements for providing an indicating signal indicating the lack of proper alignment of any one of said groupings of spots with said reading assembly; and muting means for muting the output of said demodulation means in response

to said signal indicating a lack of alignment of any one of said groupings of spots with said reading assembly.

4,170,761

REMOTELY POWERED INTERMEDIATE AMPLIFIER FOR COMMUNICATIONS TRANSMISSION

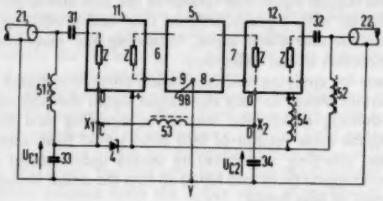
Frithjof Koppehele, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,583

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713710

Int. Cl.² H03F *1/00*

U.S. Cl. 330—166 **12 Claims**



1. In a remotely powered intermediate amplifier for communications transmission having an input terminal, an output terminal and a terminal common to input and output, said terminals being adapted for connection with a transmission line, said amplifier being remotely powered with electrical power over said transmission line, the combination comprising first and second sectional amplifiers, means connecting said input terminal to the input of said first sectional amplifier, means connecting said output terminal to the output of said second sectional amplifier, means for connecting each of said sectional amplifiers to a source of electrical power through said input and output terminals, means for decoupling the electrical power connections of said sectional amplifiers from each other for AC signals, a first capacitor connected between said common terminal and an AC reference potential of said first sectional amplifier, a second capacitor connected between said common terminal and an AC reference potential of said second sectional amplifier, and a filter circuit interconnecting the output of said first sectional amplifier and the input of said second sectional amplifier, said filter circuit having at least three ports, first and second ones of said ports being connected to said first and second sectional amplifiers and at least one further port connected to said common terminal.

4,170,762

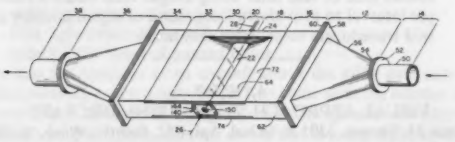
FLOW CHANNEL FOR FLUID MEDIUM LASER

Michael E. Mack, Manchester, and Jaime A. Woodroffe, Andover, both of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Sep. 20, 1976, Ser. No. 724,721

Int. Cl.² H01S *3/02*

U.S. Cl. 331—94.5 D **12 Claims**



1. A flow channel for an excitation radiation excited fluid medium laser and operative to receive fluid medium from an inlet conduit, to prepare the flow for high repetition rate, high power excitation to a lasing condition in which a low divergence, high quality laser beam is generated and to exhaust the fluid medium to an outlet conduit, said flow channel comprising:

first and second optically transmissive windows positioned in approximately facing relationship and optically transmissive to the excitation radiation for said fluid medium;

means responsive to the flowing medium from said inlet conduit for converging said flow to pass between said first and second windows;

means associated with said converging means for preparing said flow to provide thin laminar flow boundary layers in said medium flowing past said first and second windows; and

means for providing turbulent expansion including means directly downstream of said first and second windows for inducing turbulence in the laminar flow of fluid laser material flowing past said first and second windows.

4,170,763

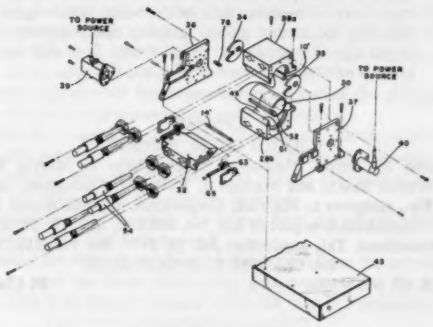
CONDUCTIVELY COOLED LASER PUMPING ASSEMBLY

Dan J. Radecki, San Jose, and Curt H. Chadwick, Los Altos, both of Calif., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 3, 1978, Ser. No. 866,512

Int. Cl.² H01S *3/045*

U.S. Cl. 331—94.5 D **7 Claims**



1. In a conductively cooled laser pumping assembly comprising a split housing having an elliptically shaped bore with first and second focal axes, said sections being connected symmetrically about a plane containing said axes and being spaced apart adjacent to said first axis whereby to define an elongated opening in said housing, a unitary elliptically shaped transparent shell snugly fitted in said bore and having focal axes coincident with said first and second axes, respectively, said shell also having an elongated slot aligned with said opening in said housing, lamp means supported within said shell and having an axis coincident with said second axis, said lamp means being adapted to radiate noncoherent light at desired laser pump wavelength λ_1 and at undesired wavelengths λ_U, said shell having a filter coating thereon, said coating being highly reflective at λ_1 and highly transmissive at λ_U, and a cylindrical rod of lasing material supported within said shell with the rod axis coincident with said second axis, the improvement comprising

means for supporting said rod comprising

a heat conductive body having one end within said shell and the opposite end outside said housing,

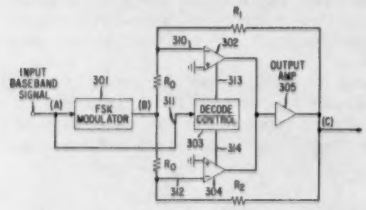
solder means between said rod and said one end of said body, said solder means having a melting temperature substantially at room temperature, and

clamp means connecting opposite ends of said rod to said body.

4,170,764
AMPLITUDE AND FREQUENCY MODULATION SYSTEM

Jack Salz, Fair Haven, and Jean J. Werner, Eatontown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 6, 1978, Ser. No. 883,656
Int. Cl.[2] H03C *5/00*; H04L *27/12*
U.S. Cl. 332—17 **3 Claims**



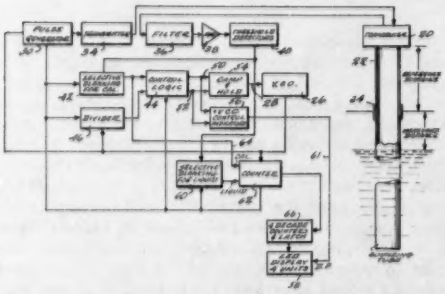
1. Apparatus for generating a waveform having amplitude and frequency concurrently and directly modulated by the same binary input signal including means responsive to the binary input signal for generating a frequency shift keyed output signal; characterized by:

amplification means, having a first and second gain, responsive to one state of the binary input signal for selecting the first gain to amplify the frequency shift keyed signal, and responsive to the other state of the binary input signal for selecting the second gain to amplify the frequency shift keyed signal wherein the ratio of said first and second gains is substantially between 0.6 and 0.9.

4,170,765
LIQUID LEVEL SENSOR

James W. Austin, Melbourne Beach; Oscar L. Morris, Fort Walton Beach, and Michael E. Rothrock, Melbourne, all of Fla., assignors to Marvtek, Corporation, Satellite Beach, Fla.

Continuation-in-part of Ser. No. 568,852, Apr. 17, 1975, abandoned. This application Jul. 22, 1977, Ser. No. 818,192
Int. Cl.[2] G01S *9/68*; G01F *23/00*
U.S. Cl. 367—100 **24 Claims**



1. An apparatus for providing an output indicating the level of liquid comprising:

a transducer for producing in response to a trigger signal, a pulse which is transmitted toward the liquid and producing, in response to receipt of an echo signal, an electrical signal,

a calibration target for producing a first echo signal in response to receipt of pulse from said transducer,

means for mounting said transducer above said liquid with said target disposed between said transducer and said liquid at a fixed distance from said transducer so that said tranducer receives a first signal from said target before a second echo signal is received from said liquid, said calibration target being constructed so as to allow expansion of said pulse from said transducer so that the first echo signal produced has a reverse wave shape from the second echo signal received from said liquid.

circuit means for receiving the second echo signal from said liquid surface and said trigger signal producing an output signal indicating liquid level which varies as a function of the time between receipt of the trigger signal and receipt of the first and second echo signals from the calibration target and the liquid surface,

means connected to said transducer for producing said trigger signal and applying the produced trigger signal to said transducer,

comparator means for receiving the first and second echo signals and the trigger signal from said trigger signal producing means, comparing the time between receipt of the trigger signal and receipt of the first and second echo signals with a predetermined time and producing a calibration correction signal indicating the magnitude and direction of the difference.

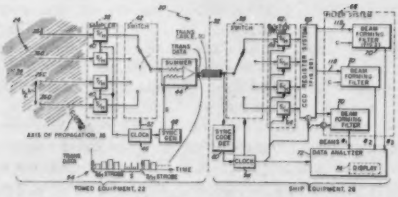
means for applying said calibration correction signal to said circuit means to vary the output signal thereof, and

a counting means and means for enabling said counting means upon receipt of said echo signal from said target and disabling said counting means upon receipt of said echo signal from said liquid so that the count indicates the level of said liquid.

4,170,766
BEAMFORMER

Roger G. Pridham, Providence; Andrew C. Callahan, Newport, and Ronald A. Mucci, Jamestown, all of R.I., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 27, 1978, Ser. No. 873,042
Int. Cl.[2] G01S *3/80, 3/00*
U.S. Cl. 367—135 **11 Claims**



1. A beamformer for forming a beam from signals of an array of transducers, said beamformer comprising:

means for sampling signals of individual ones of said transducers to provide samples of said signals;

means for delaying said samples in increments of fractional amounts of the intersample interval between successive signal samples of any one of said transducers;

a beamforming filter; and

means connected between said delaying means and said filter for coupling individual ones of said samples, one at a time, from said delaying means to said filter, the impulse response time of said filter being longer than said intersample interval to provide an integration of signal samples of said transducers to produce said beam.

4,170,767
VISUAL APPROACH SYSTEM FOR AIRCRAFT

Jesse H. Tanner, 3201 S. 192nd, Apt. 312, Seattle, Wash. 98188

Continuation-in-part of Ser. No. 772,077, Feb. 25, 1977, abandoned. This application Jul. 27, 1977, Ser. No. 819,269
Int. Cl.[2] G08G *5/00*
U.S. Cl. 340—26 **7 Claims**

1. A visual approach system for indicating the glide path of

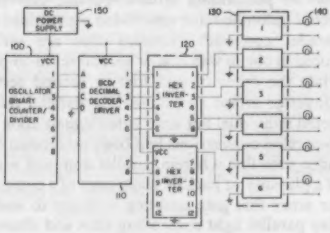
an aircraft to a runway so that the operator of an aircraft using the system sees an apparent upward motion when below the air space enclosed by predetermined glide path, an apparent downward motion when above the air space enclosed by the predetermined glide path, and alternating flashing lights of first and second colors with no apparent motion when within the glide path, the approach system comprising:

a single light generating unit positioned along the runway including means for generating a third and fourth light beam of a first and second color respectively, the light generating unit adjusted such that the third light beam pattern extends from the lower edge of the glide path upward and the fourth light beam pattern extends from the upper edge of the glide path downward,

a second light generating unit positioned in line with and spaced from the single light generating unit toward the departure end of the runway, the second light generating unit including means for generating a second beam of light of the first color, the unit adjusted so that the second beam overlaps the upper edge of the fourth light beam pattern and glide path and extends upward,

a first light generating unit positioned in line with and spaced from the second and single light generating units toward the departure end of the runway, the first light generating unit including means for generating a first beam of light of the first color, the unit adjusted so that the first light beam pattern extends from the upper edge of the fourth light beam pattern and glide path upward,

a fourth light generating unit positioned in line with and spaced from the single light generating unit toward the approach end of the runway, the fourth light generating including means for generating a fifth beam of light of the second color, the unit adjusted so that the fifth beam overlaps the lower edge of the third light beam pattern and glide path and extends downward,



a fifth light generating unit positioned in line with and spaced from the single light generating unit and fourth light generating unit toward the approach end of the runway, the fifth generating unit including means for generating a sixth beam of light of the second color, the unit adjusted so that the sixth light beam pattern extends from the lower edge of the third light beam pattern and glide path downward, and

control means for sequentially illuminating the light beams of the respective light generating units as follows:

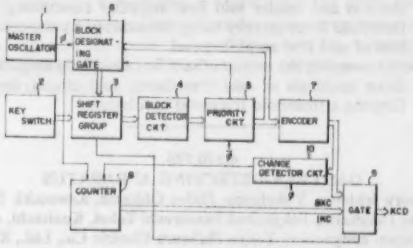
first light beam of first color
second light beam of first color
third light beam of first color
sixth light beam of second color
fifth light beam of second color and
fourth light beam of second color,

so that the operator of an aircraft above the glide path sees a downwardly moving light of the first color with the number of downward movements being increased for greater deviations from the glide path; sees an upwardly moving light of the second color when below the glide path with the number of upward movements increased for greater deviations from the glide path; and sees alternating flashing lights of first and second color with no apparent motion when within the glide path.

4,170,768
KEY CODE GENERATOR

Hiroshi Kitagawa, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Jun. 30, 1977, Ser. No. 811,637
Claims priority, application Japan, Jul. 2, 1976, 51-78644
Int. Cl.[2] H03K *1/00*
U.S. Cl. 340—365 S **3 Claims**



1. A key code generator comprising:

a group of memories, each corresponding to a respective one of a corresponding group of blocks of key switches and for temporarily storing in parallel the closed states of the switches in a concurrent manner and capable of providing both a serial and a parallel output for each block;

a block detector for concurrently detecting all the memories corresponding to those blocks that have even one key switch in its closed state, by reading the parallel output from said memories;

a priority selector for sequentially designating the detected blocks in a predetermined order of priority;

a block designating gate means for supplying clock pulses to the memories corresponding to the designated blocks to serially read out therefrom key data in accordance with the output from the priority selector;

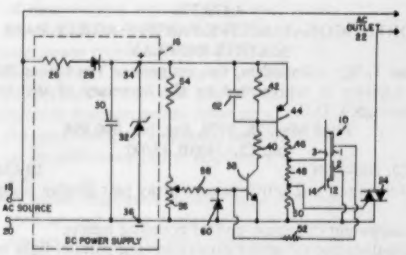
an encoder for encoding the output from the priority selector into a binary code; and

means for detecting a change in the output from the encoder to reset the block designating gate means when the key data is no longer detected from the read out memories.

4,170,769
AUDIO-DETECTOR ALARM

James C. Morris, Wakefield, Mass., and Robert L. Garrison, Henniker, N.H., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sep. 6, 1978, Ser. No. 940,061
Int. Cl.[2] G08B *3/00, 13/00*
U.S. Cl. 340—384 E **11 Claims**



1. An audio transducer circuit responsive to the detection of sound above a predetermined threshold level for producing an alarm, said transducer circuit comprising:

an electroacoustical transducer having a plurality of terminals;

a source of DC voltage;

a first switching amplifier coupled to said DC source and biased to be normally nonconducting;

means coupling voltage output terminals of said transducer to the input of said first amplifier whereby activation of said transducer by sound above said predetermined threshold level causes a voltage of sufficient magnitude to be applied to said first amplifier to overcome the bias thereon and render said first amplifier conducting, said threshold level thereby being determined by the selected bias of said first amplifier; and

means coupling the output of said first switching amplifier to drive terminals of said transducer, said circuit thereby forming a threshold triggered oscillator.

4,170,770

GAS LEAK-DETECTING APPARATUS

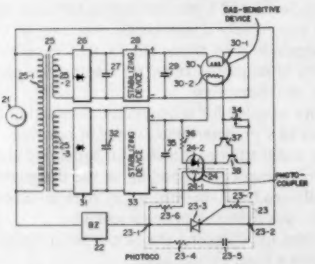
Noboru Ichinose, Yokohama; Hideo Ohkuma, Kawasaki; Takashi Takahashi, Tokyo, and Masayoshi Takei, Kunitachi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki and Masayoshi Takei, Tokyo, both of, Japan

Filed Oct. 5, 1977, Ser. No. 839,452

Claims priority, application Japan, Oct. 8, 1976, 51-121027

Int. Cl.[2] G08B *17/10*

U.S. Cl. 340—634 **10 Claims**



1. A gas leak-detecting apparatus comprising a gas-detecting element having a heater and an oxide semiconductor to be heated indirectly by the heater; a first power source between the output terminals of which the heater is connected; a second power source; a gas-detecting circuit connected in series between the output terminals of the second power source and including the oxide semiconductor and the input circuit of a non-contact type switch; a third power source; and an alarm circuit connected in series between the terminals of the third power source and including the output circuit of the non-contact type switch and an alarm element.

4,170,771

ORTHOGONAL ACTIVE-PASSIVE ARRAY PAIR MATRIX DISPLAY

Vincent T. Bly, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 28, 1978, Ser. No. 890,896

Int. Cl.[2] H05B *33/00*

U.S. Cl. 340—781 **10 Claims**

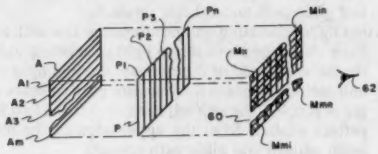
1. An orthogonal active-passive array pair display comprising:

a transparent dielectric optical coupling means;

a one-dimensional active display having parallel light emitting lines on an input side of said transparent dielectric optical coupling means with the output emissions of each of said parallel light emitting lines being separately controllable by enabling voltages applied thereto;

a one-dimensional passive display having parallel light controlling lines on an output side of said transparent dielectric optical coupling means that are orthogonal to said parallel light emitting lines with the transmission of each of said parallel light controlling lines being separately controllable by enabling voltages applied thereto in which the output emissions of said active display are seen by said passive display through said transparent dielectric optical coupling means; and

a control electronic means for accepting video-type input signals and for modifying said video-type input signals therein for separately controlling the enabling voltages applied to said active display and to said passive display by providing a preferred scan mode of the enabling voltages applied to individual lines of said parallel light emitting lines and said parallel light controlling lines in which each video line is applied to one individual line of said parallel light emitting lines of said active display and to all of said parallel light controlling lines of said passive display



through first and second serial-to-parallel converter arrays that simultaneously control all of said passive display lines by performing serial-to-parallel conversions on selected individual line scan video signals into a plurality of parallel converter elements that are serial-to-parallel stored in one of said first or second serial-to-parallel arrays while the other of said first or second serial-to-parallel converter arrays simultaneously parallel dump other selected individual line scan video signals upon which serial-to-parallel conversions had been performed on a previous video scan line wherein parallel dumping is into the gates of a plurality of parallel transistors of a compatible transistor array that gate enabling voltages to said passive display parallel light controlling lines and alternately repeating the serial-to-parallel conversions and parallel dumping between said first and second serial-to-parallel converter arrays of selected individual line scan video signals in order to display information contained in said video-type input signals.

4,170,772

FLAT PANEL DISPLAY WITH FULL COLOR CAPABILITY

Vincent T. Bly, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,204

Int. Cl.[2] H05B *33/00*; G02F *1/13*

U.S. Cl. 340—781 **15 Claims**

1. A color capable electroluminescent flat panel display comprised of:

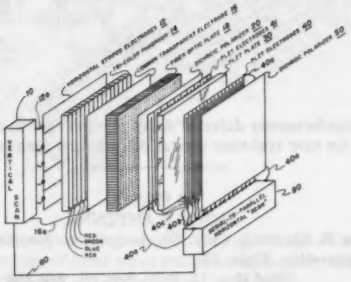
an optically thin dielectric spacer;

an active light emitting linear electroluminescent panel comprised of a phosphor screen having a plurality of vertical color phosphor stripes with a plurality of opaque horizontal stripe electrodes on the back side thereof and a common transparent electrode on the front side thereof wherein said common transparent electrode is contiguous with an input side of said optically thin dielectric spacer and wherein said active light emitting electroluminescent panel produces a horizontal scan pattern of various color dots therefrom in accordance with incoming video signals;

vertical scan electronic means for selectively activating said

opaque horizontal stripe electrodes in sequence with said incoming video signals entering said vertical scan electronic means;

a passive light transmitting portion on an output side of said optically thin dielectric spacer for modulating said video signals emitted from said active light emitting portion through said optically thin dielectric spacer, said passive light transmitting portion comprised of an electrically induced birefrengent material plate having a plurality of linear interdigital surface electrodes alternately between a common ground electrode on each side thereof with said plate and electrodes sandwiched between first and second



orthogonal linear dichroic polarizer plates on an output side of said optically thin dielectric spacer with said plurality of interdigital surface electrodes optically aligned with said plurality of vertical color phosphor stripes of said active light emitting portion; and

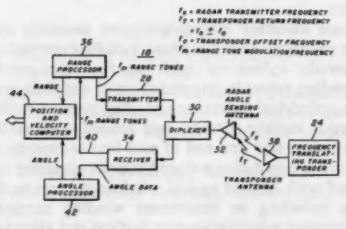
serial-to-parallel horizontal scan electronic means for applying information on a sequentially scan line basis from one scan line of said incoming video signals into a scan of voltages on all of said plurality of interdigital surface electrodes to vary the transmission of the image from the said one scan line of said active light emitting portion to a display according to the intensity and color information along the said one scan line.

4,170,773

PRECISION APPROACH SENSOR SYSTEM FOR AIRCRAFT

George W. Fitzsimmons, Lynnwood; Lawrence W. Robinson, Seattle, and Jim S. Takeuchi, Mercer Island, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 5, 1978, Ser. No. 903,312
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.5 R **4 Claims**



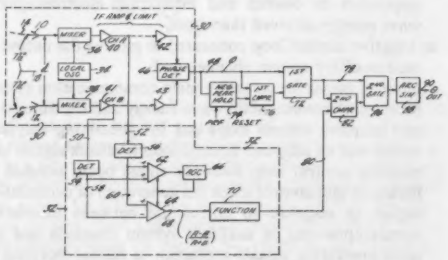
1. A precision approach system for two aircraft comprising radar means on one of said aircraft for directing radio wave energy toward the other aircraft at a carrier frequency f_x, means for modulating said carrier frequency with a range tone, transponder means on the other aircraft for receiving wave energy at frequency f_x, said transponder means including a mixer for mixing wave energy received at frequency f_x with a signal at frequency f_o to produce a signal at frequency f_t which is equal to $f_x \pm f_o$, means in said transponder for modulating carrier wave energy at frequency f_t with said range tone and for directing the modulated carrier wave energy at frequency f_t back to said first aircraft, said transponder means operating in an active mode with signal gain at ranges beyond a predetermined range and operating in a passive mode with no gain at ranges less than said predetermined range, said active mode being effected by an oscillator which is coupled to said mixer in the transponder means and which oscillates at the frequency f_t only when the transponder is operating in the active mode, and means incorporated into said radar means responsive to the signal received from said transponder means for determining the range of said other aircraft and its angular position with respect to said one aircraft.

4,170,774

AMPLITUDE SELECTED PHASE INTERFEROMETER ANGLE MEASURING RADAR

Carl F. Schaefer, Westport, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 24, 1972, Ser. No. 219,775
Int. Cl.[2] G01S 3/22, 3/32, 9/22
U.S. Cl. 343—16 M **8 Claims**



1. In a phase interferometer radar elevation angle measuring system, the combination comprising:

receiver means, including a pair of antennas, relatively displaced and tilted in a plane within which elevation angles to radar targets are to be determined, for presenting a pair of time varying signals representing target return signals received by the respective antennas;

phase means responsive to said receiver means for generating a phase function signal as a function of the phase difference between said pair of signals;

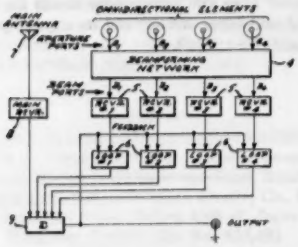
amplitude function means responsive to said receiver means for generating an amplitude function signal as a function of the difference of the amplitudes of said pair of signals; and

gate means responsive to said phase function signals generated by said phase means and to said amplitude function signals generated by said amplitude means for comparing said phase function signals with said amplitude function signals and for presenting signals representing elevation angles to targets in response to related ones of said phase function signals being within prescribed limits of corresponding ones of said amplitude function signals.

4,170,775
COMMUNICATION SYSTEM BEAMPORT SIDELOBE CANCELLER

Raymond J. Masak; Herbert F. Baurle, both of East Northport, and Anthony M. Kowalski, Miller Place, all of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 30, 1977, Ser. No. 866,186
Int. Cl.[2] H04B 1/10
U.S. Cl. 343—100 LE 1 Claim



1. An electromagnetic wave communication system having means for discriminating against interfering signals comprising

a main communication system for receiving desired and interfering electromagnetic wave energy from a given angular region of space,

an auxiliary n-channel system for receiving and space filtering into n discrete contiguous segments electromagnetic wave energy from said angular region of space, each channel thereof being assigned to a different spatial segment of said angular region of space and having an output responsive to desired and interfering electromagnetic wave energy received therefrom,

an adaptive control loop connected to receive the output of each auxiliary system channel, and

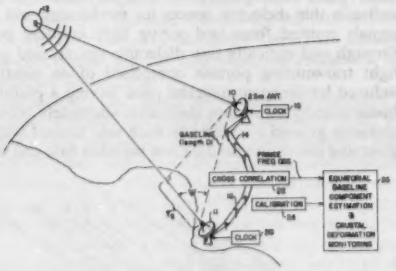
combining means for summing main communication system received electromagnetic wave energy and the outputs of said adaptive control loops and for generating a system output and an adaptive control loop feedback signal, said adaptive control loop feedback signal being adapted to initiate in said control loops the generation of cancellation signals in response to correlation between interfering signals appearing in auxiliary system channels and the same interfering signals appearing in related portions of the main communication system received electromagnetic wave energy.

4,170,776
SYSTEM FOR NEAR REAL-TIME CRUSTAL DEFORMATION MONITORING

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Peter F. MacDoran, Altadena, Calif.

Filed Dec. 21, 1977, Ser. No. 863,024
Int. Cl.[2] H04B 7/00
U.S. Cl. 343—112 D 6 Claims

1. In a system for monitoring crustal deformation using long-baseline radio interferometry, the method of receiving at two independent stations a radio signal of limited spectrum from a source at a known location is space, maintaining synchronized clocks at said station, time tagging the radio signal received at each station, transmitting the time-tagged radio signal received at each station to a convenient location for cross correlation using communication channels having a bandwidth sufficient for said limited spectrum, adjusting the transmission delay of one radio signal relative to the other to synchronize time tags prior to cross correlation, and estimating

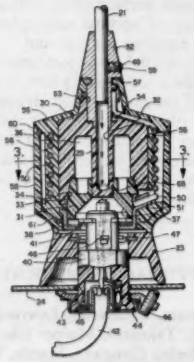


the interferometer delay or delay rate in order to derive baselines for near real-time crustal deformation monitoring.

4,170,777
MOBILE ANTENNA

James P. Liautaud, Cary, Ill., assignor to American Antenna Corporation, Elgin, Ill.

Filed Dec. 13, 1977, Ser. No. 860,236
Int. Cl.[2] H01Q 1/32, 9/00, 1/50, 9/30
U.S. Cl. 343—715 10 Claims



1. A mobile antenna operable from a source of radio frequency energy comprising, in combination:

an elongated radiating element;

an antenna base assembly for supporting said radiating element;

said base assembly including a core assembly comprising first and second core sections, said first core section being generally cylindrical with an first elongated axially-extending recess in one end thereof, and defining a generally cylindrical inductance winding support surface on the exterior surface thereof, said second core section being secured to said one end of said first section to close said first recess to define a closed interior chamber axially-disposed with respect to said winding support surface, and

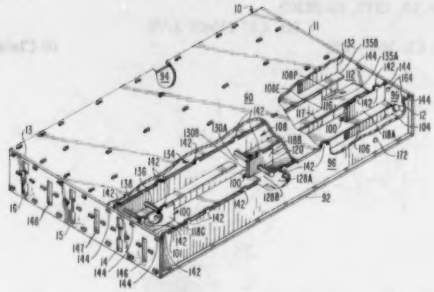
means including an inductance winding carried on said inductance winding support surface and electrically connected at one end to said radiating element, and connectable at its other end to the source of radio frequency energy, for conveying the radio energy to said radiating element an integral overmold layer formed on said winding support surface for supporting said inductance winding wherein said second core section defines an exterior locking surface, and said overmold layer extends over said exterior locking surface to maintain said first and second core sections in engagement.

4,170,778

FREQUENCY-SCANNED ANTENNA

David F. Bowman, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,559
Int. Cl.[2] H01Q *13/10*
U.S. Cl. 343—771 9 Claims



1. A frequency-scanned antenna of the type that provides a desired percentage of input wave energy to each of a plurality of radiating elements, the improvement comprising:

a rectangular radiating waveguide having one of said radiating elements connected to its distal end;

a rectangular launching waveguide coupled to said radiating waveguide via passageways through a length-wise common segmented wall, the proximal end of said launching waveguide being adapted to have said input wave energy launched towards the distal end thereof; and

first and second similar reactive attenuators that pass a known percentage of said input wave energy and reflect the remainder, said first and second attenuators being respectively disposed in the wavelengths of said radiating and launching waveguides, said passageways forming a pair of three-db, ninety-degree hybrids connected back to back through said attenuators that cause said known percentage of said input wave energy to be coupled to said one radiating element and the remainder to be coupled to the proximal end of said radiating waveguide.

4,170,779

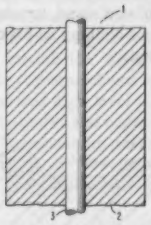
PRINT HEAD ELECTRODE FOR METAL PAPER PRINTERS

Dietrich J. Bahr; Karl H. Burckardt, both of Herrenberg, and Wilhelm G. Spruth, Dagersheim, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,405
Claims priority, application Fed. Rep. of Germany, May 2, 1977, 2719506
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—139 C 1 Claim

1. An electrode for marking an erodible recording member in an electroerosion printer comprising:

an electrically conductive core material in contact with said member having a first melting point and selected from the group consisting of tungsten or molybdenum having a cross-section of less than 50 μm, supported in a sheath of consumable, electrically conductive material selected from the group consisting of silver, nickel, copper or Wood's alloy, said sheath being substantially coextensive



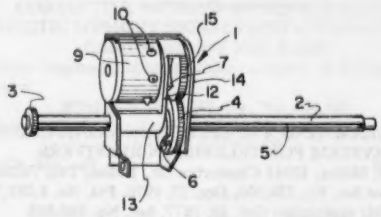
with said core and having a second melting point lower than said first melting point.

4,170,780

RECORDING HEAD FOR MULTIPOINT RECORDER

Patrick Caron, Molliens-Dreuil, and Francis Manier, Sains en Amienois, both of France, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 10, 1978, Ser. No. 950,255
Int. Cl.[2] G01D *15/02, 9/28*
U.S. Cl. 346—141 2 Claims



1. A recording head for graphical multipoint recording including a drum bearing a number of recording stylii regularly spaced around the periphery and rotatably mounted on an axle in a moving carriage sliding along a bearing bar mounted in the chassis of the recorder, means for rotational driving said drum, means for temporarily displacing the drum in the direction of the strip chart and means for translational displacement of the carriage along the bearing bar, characterized in that said means for rotational driving the stylii bearing drum comprises a Geneva cross rigidly connected to said drum and driven by a pin on a first gear wheel attached to the bearing bar which is rotationally driven and that the means for causing the displacement of said recording head includes a cam rigidly connected to a second gear wheel meshing said first gear wheel bearing said pin whereby said cam cooperates with an abutment of a housing supporting the stylii bearing drum and mounted on said carriage for free oscillation around an axle parallel to the bearing bar.

4,170,781

PHOTODIODE AND METHOD OF MANUFACTURE

John T. Cox, Alexandria, Va.; Michael B. Garber, Columbia, S.C.; Marilyn A. Jasper, Springfield, and Randolph E. Longshore, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

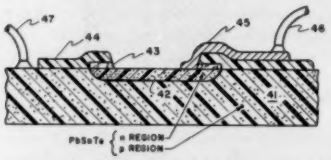
Filed Apr. 6, 1978, Ser. No. 893,847
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 2 Claims

1. A photodiode comprising:

a chip of a p-type lead-tin-telluride semiconductor having lead diffused into at least one portion of one surface

thereof to form at least one island of n-type semiconductor surrounded by said p-type semiconductor;

a frame of inorganic dielectric material covering a continuous border region of said island, terminating at the perimeter of said island and defining an exposed central surface portion of said island;



a layer of organic photoresist material covering each such frame and at least a portion of said p-type semiconductor; and

an indium leadout contacting said exposed central portion of said island and overlapping said frame, said photoresist material and said p-type semiconductor.

4,170,782

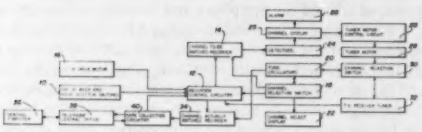
PROGRAMMING AND SELECTION MONITORING SYSTEM FOR TELEVISION RECEIVERS

Arthur O. Miller, 10141 Chesterton Dr., Dallas, Tex. 75238

Division of Ser. No. 750,000, Dec. 13, 1976, Pat. No. 4,081,753. This application Oct. 28, 1977, Ser. No. 846,315

Int. Cl.[2] H04N *7/02*

U.S. Cl. 358—84 **7 Claims**



1. A television monitoring system for monitoring the use by individual television viewers of a plurality of television receivers, each including a tuner, located at a plurality of remote locations in response to an interrogation signal transmitted from a central station comprising:

means interconnected with each of the plurality of television receivers for generating a plurality of unique tones, wherein ones of said tones correspond to a particular television channel being viewed by a television viewer;

recording means for continuously recording on a recording medium ones of said tones to generate a record corresponding to the particular channels viewed over a period of time by a television viewer;

a telephone interconnection to said recording means;

means for interconnecting said recording means to said telephone subscriber system upon receipt of the interrogation signal to actuate said recording means to cause transmission of said previously recorded tones via said telephone subscriber system to the central station; and

means for preventing the ringing of said telephone upon receipt of the interrogation signal from the central station.

4,170,783

SIGNAL PICKUP DEVICE FOR REPRODUCING AN INFORMATION SIGNAL RECORDED ON A TRACK OF A ROTARY RECORDING MEDIUM

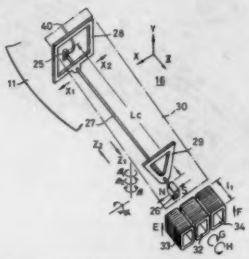
Osamu Tajima, Ayase, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 13, 1978, Ser. No. 885,579

Claims priority, application Japan, Mar. 14, 1977, 52-27714; Mar. 15, 1977, 52-28262

Int. Cl.[2] H04N *5/76*

U.S. Cl. 358—128 **10 Claims**



1. A signal pickup device for use in an apparatus for reproducing an information signal recorded in a track on a horizontal surface of a grooveless rotary recording medium, said signal pickup device comprising:

a reproducing stylus means for tracing the track on the rotary recording medium, thereby reproducing an information signal recorded in the track;

means including a cantilever arm supported by damper means so as to be rotatable about substantially the proximal end and movable in an axial direction, and having said reproducing stylus at a free distal end thereof;

means comprising a permanent magnet fixed to the proximal end of said cantilever arm and having magnetic poles on the opposite lateral faces thereof, said poles extending in the axial direction of said cantilever arm means, movement of said magnet causing said cantilever to move said reproducing stylus;

a tracking control coil means secured to a support structure of said pickup device with a pair of winding surface portions extending in substantially a vertical direction to confront the poles of said permanent magnet; and

means for generating a tracking control signal current in response to a tracking error, said signal current being supplied to said tracking control coil means,

the tracking control signal current fed to said tracking coil means flowing through said pair of vertical winding surface portions in opposite directions with respect to each other, the electromagnetic field resulting from the energization of said coil causing said permanent magnet to rotate about a vertical axis for rotating said cantilever arm means, due to a mutual reaction between the electromagnetic field and the tracking control signal current, whereby the reproducing stylus is displaced so as to trace a track with the tracking error controlled.

4,170,784

ISO-HOT STARTUP AID

Scott H. Baker, Brockport, and David E. Manners, Alexander, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jul. 28, 1978, Ser. No. 928,669

Int. Cl.[2] H04N *3/18*

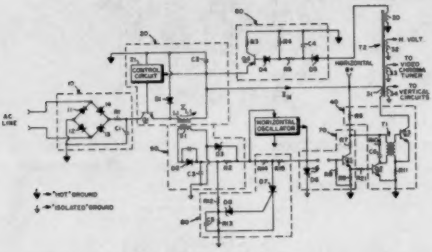
U.S. Cl. 358—190 **12 Claims**

7. In an electronic apparatus having a plurality of voltage supplies including at least one derivative supply which is derived from a primary supply, a method improving the operation of the derivative supply comprising the steps of:

magnetically coupling a winding of the derivative supply to an inductive element of the primary supply so that the voltage developed by the derivative supply is related to the current flowing in the inductive element;

detecting a voltage whose amplitude is determined by the voltage developed by the derivative supply, and

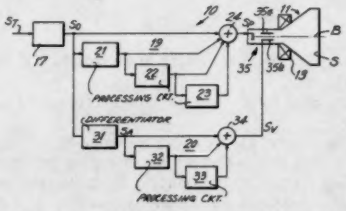
selectively coupling a switchable momentary load across the primary supply in accordance with the detected voltage so that an additional incremental current flows in the inductive element when the detected voltage is below a predetermined value indicative of the fact that the output of the derivative supply is below a desired value, whereby the additional incremental current results in a greater induced voltage in the winding and a greater output developed by the derivative supply.



4,170,785
VIDEO SIGNAL REPRODUCING APPARATUS WITH ELECTRON BEAM SCANNING VELOCITY MODULATION

Susumu Yoshida, Naritanishi; Yoshio Ishigaki, Tokyo; Kinya Shinkai, Yokohama, and Takao Tsuchiya, Fujisawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 23, 1977, Ser. No. 854,398
Claims priority, application Japan, Nov. 30, 1976, 51-144565
Int. Cl.[2] H04N *5/68, 5/14*
U.S. Cl. 358—242 **15 Claims**



1. A video signal reproducing apparatus comprising:

a source of a video signal representing at least the brightness of a video picture and in which bright picture portions are each represented by a video signal portion of high level defined between respective rising and falling edges extending from low level signal portions representing relatively dark picture portions contiguous to the bright picture portion;

waveshaping means receiving said video signal from said source for providing a corresponding compensated video signal in which the width of each of said high level signal portions between said respective rising and falling edges is increased;

a cathode ray tube having a screen, an electron gun including beam producing means directing an electron beam generally along the axis of the tube toward said screen for impingement on the latter and being controlled in response to said compensated video signal from said waveshaping means so that the intensity of the beam is modulated in accordance with said compensated video signal, and means for causing said beam to scan said screen in line-scanning and vertical directions, respectively;

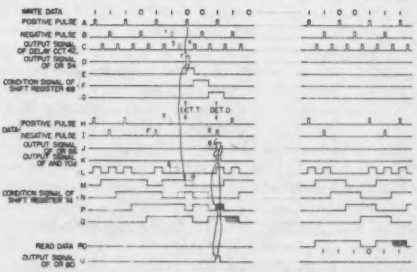
beam velocity modulation control means connected with said source of the video signal for providing therefrom a beam velocity modulation signal having positive and negative peaks in correspondence to said rising and falling edges of each of said high level signal portions with the positions of said positive and negative peaks being shifted, relative to the corresponding peaks of a differentiation of said video signal, in the directions toward the adjacent low level signal portions of said compensated video signal; and

beam deflection means for modulating the scanning velocity of said electron beam in said line-scanning direction in accordance with said beam velocity modulation signal.

4,170,786
CORRECTIVE METHOD OF REPRODUCING MAGNETIC MEMORY SIGNALS AND APPARATUS FOR CARRYING OUT THE SAME

Norihiko Sugimoto, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 20, 1978, Ser. No. 888,466
Claims priority, application Japan, Mar. 25, 1977, 52-32224
Int. Cl.[2] G11B *5/09*
U.S. Cl. 360—40 **10 Claims**

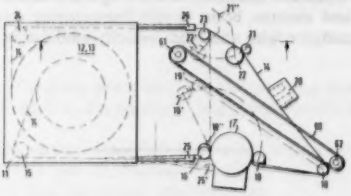


1. A corrective method of reproducing magnetic memory signals for reading out and reproducing digital information recorded in a magnetic recording medium by an NRZ-I method, characterized by comprising the steps of detecting timing pulse signals comprised of magnetic inversion signals in positive and negative directions which are produced alternately, delaying said timing pulse signals by a predetermined delay time, applying the delayed timing pulse signals to a group of shift registers as the timing pulses for said shift registers, detecting, through a receipt of two successive timing signals of the same direction of magnetic inversion, a falling off of a timing pulse signal taking place between said two successive timing signals, producing a correcting timing pulse at an instant at which the succession of two timing pulse signals in the same direction of magnetic inversion takes place, memorizing the data corresponding to said correcting timing pulse in said shift registers, and correcting said data memorized in said shift registers at an instant when a falling off of data is detected through detecting two successive read data signals in the same direction of magnetic inversion.

4,170,787
TAPE RECORDING/REPRODUCING APPARATUS, PARTICULARLY FOR OPERATION WITH VIDEO TAPE CASSETTES

Peter Gunschmann, Darmstadt; Heinrich Rossmann; Theo Wolf, both of Rossdorf, and Dieter Gause, Welterstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,417
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713524
Int. Cl.[2] G11B *15/66, 15/18, 23/04*
U.S. Cl. 360—95 15 Claims



1. Tape recording/reproducing apparatus adapted to have a tape cassette (11) inserted therein, in which the cassette retains a record/reproducing tape (14) and two spools (12, 13), comprising

guide roller means (16, 23) located to guide the tape in a direct path between said spools;

tape drive means (21, 22);

a cylindrical record/reproduce head (17) forming a tape record/reproduce means; (17);

means engageable with the tape to move the tape into an operating path in which the tape can engage the drive means (21, 22) and the record/reproduce means (17) including

a plurality of tape guide rollers (16, 18, 19, 23);

a movable tape guide roller element (19) movable in an essentially straight-line path between a first position (19') within a loop formed by said straight-line path and said spools, and in which the tape bypasses the record/reproduce means, to an operating position in which the tape is in engagement with the record/reproduce means (17), said movable tape guide roller element being formed by one of said rollers (19) and comprising that one of said rollers located furthest from the cassette when the cassette is inserted in the apparatus and the tape is in the operating position;

one of said guide rollers (18) being movable from a first position (18') within said loop to an operating position adjacent said cylindrical head (17);

wherein the paths of movement of said guide roller element and said movable guide roller (18) interfere with each other;

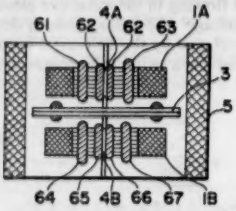
and wherein the movements of said guide rollers are sequential.

4,170,788
MAGNETIC HEAD

Komei Hashimoto; Masahiro Komatsubara; Shinji Yasuda; Yutaka Masumoto, and Kazuhiko Satoh, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 4, 1977, Ser. No. 839,467
Claims priority, application Japan, Oct. 5, 1976, 51-119547
Int. Cl.[2] G11B *5/10, 5/251, 5/12*
U.S. Cl. 360—129 7 Claims

1. A magnetic head for a magnetic recording and reproducing instrument, such as a tape recorder, said head being of the type having a sliding surface including a magnetic core defining a gap, a shield plate, a core holder and a gap spacer, the improvement comprising at least one of said core holder and gap spacer being constructed of a material having a lower galvanic potential than the elements forming said magnetic

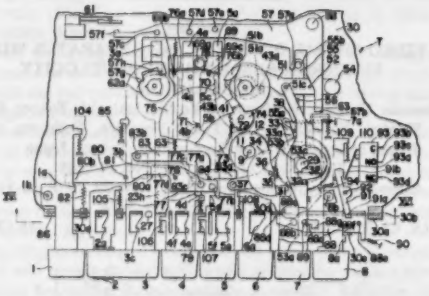


core and said shield plate, and means electrically interconnecting said at least one of said core holder and gap spacer with said magnetic core and said shield plate.

4,170,789
MAGNETIC TAPE RECORDING AND REPRODUCTION APPARATUS

Satoshi Inoue, Ibaragi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 17, 1977, Ser. No. 842,873
Claims priority, application Japan, Oct. 18, 1976, 51-125304
Int. Cl.[2] G11B *15/48, 15/22*
U.S. Cl. 360—137 3 Claims



1. A magnetic tape recording and reproducing apparatus comprising:

a motor means for driving the tape for recording and playback;

a slidable support plate slidably mounted on said apparatus and having means thereon for engaging the tape for recording on and/or reproducing from the tape and being movable between an advanced position in which the motor is connected for driving the tape and a retracted position spaced a predetermined distance from the advanced position in which the tape is not driven;

a push-button manipulating means for moving the slidable support plate to the advanced position;

an automatic stopping safety means having a detector means for detecting an interruption of movement of the magnetic tape and moving means driven by said motor for returning the push-button manipulating means to an inoperative position in response to the interruption of the movement of the tape;

a first actuating member having a temporary stop button means operatively connected thereto and operable to move the slidable support plate to the retracted position when said temporary stop button means is manipulated;

a second actuating member having a cuing and review button means operatively connected thereto and operable to move the slidable support plate to the retracted position when said cuing and review button means is manipulated,

said second actuating member, when said support plate is moved to the retracted position by said first actuating member, being freed to move to a pivoted position corresponding to its position to which it is moved by said cuing and review button means;

a third actuating member connected to said second actuating member and having moving means connected thereto for moving said third actuating member both when said second actuating member is moved by said cuing and review button means and when said second actuating member is freed for movement by the actuating of said first actuating member by said temporary stop button means, said second actuating member, when it is freed, being moved to the pivoted position by the movement of said third actuating member; and

a pivotally supported lever with which said third actuating member is engaged and engaged with said automatic stopping safety means and operable in response to the movement of said third actuating member for interrupting the drive of said moving means by said motor means, whereby said automatic stopping safety means is prevented from operating when said apparatus is operated for temporarily stopping the running of the tape for a cuing or reviewing operation.

4,170,790
TAPE RECORDER DEVICE WITH TAPE RUNNING SPEED DISPLAY

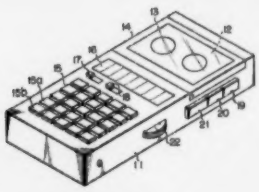
Ken Satoh, Hachioji, and Yoshio Tomizawa, Tama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1977, Ser. No. 855,559

Claims priority, application Japan, Nov. 30, 1976, 51-143582; Nov. 30, 1976, 51-143583

Int. Cl.[2] G06F *15/02*; G11B *1/04*

U.S. Cl. 364—705 **11 Claims**



1. A tape recorder comprising:

a desk top calculator unit including a key board having a plurality of keys, an arithmetic circuit, a control circuit and a display device;

a tape recorder unit which includes a drive circuit and an audio circuit and performs record and reproduction to and from a magnetic tape travelling at a given speed;

a tape speed detector which detects travelling speed of the magnetic tape to produce an electrical signal corresponding to the travelling speed of tape;

means which calculates actual tape speed on the basis of the electrical signal from said speed detector to produce actual speed data;

a reference speed data memory for storing reference speed data corresponding to reference travelling speed of tape; and

arithmetic means to which the reference speed data from said reference speed data memory and the actual speed data from said actual speed data generating means are supplied to calculate deviation of the actual speed from said reference speed thereby to obtain deviation data;

wherein deviation data corresponding to said deviation obtained from said arithmetic means is applied to the display device of said desk top calculator, and said deviation is digitally displayed by the display device.

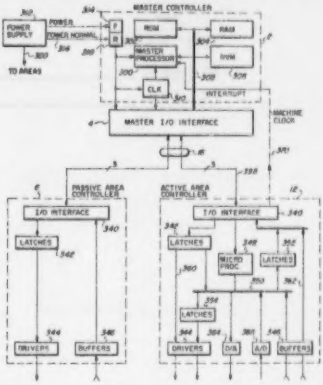
4,170,791
SERIAL DATA COMMUNICATION SYSTEM FOR A REPRODUCTION MACHINE

John W. Daughton, Fairport, N.Y.; Kenneth Gillett, Redondo Beach; Frank Nelson, Sherman Oaks, both of Calif., and Stephen P. Wilczek, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,012

Int. Cl.[2] G03G *15/00*; G06F *3/00, 15/20*

U.S. Cl. 364—900 **17 Claims**



1. In a reproduction machine having a plurality of devices for controlling operation of said machine, a data communication system comprising:

a. a master unit including a programmable controller for controlling at least some of said devices, memory storage means for storing programs and command and data bytes, and an address and data bus,

b. interface means connected to said address and data bus of said master unit and including:

1. means connected to said data bus for storing a command byte,

2. means connected to said data bus for storing an output data byte,

3. means for transmitting said command and output data bytes along a first communication path, and

4. means for storing an input data byte, said input data byte storing means connected to receive data along a second communication path, and connected for providing said received data to said data bus of said master unit, and

c. a remote unit connected to receive said command and output data bytes from said first communication path and for transmitting input data bytes to said input data byte storing means of said interface means along said second communication path, said remote unit connected for sensing operation of at least some of said devices and for operating said devices,

said interface means including means for generating a simplex/duplex bit in said command byte for initiating a simplex mode of operation in said remote unit wherein data is read by said master unit from said remote unit and for initiating a duplex mode of operation in said remote unit wherein data is read by said master unit from said remote unit and data is written into said remote unit by said master unit,

said remote unit further including circuit means responsive to said simplex/duplex bit for operating said remote unit in either of said simplex and duplex modes.

DESIGN PATENTS

GRANTED OCT. 9, 1979

ERRATA

For CLASS	See PATENT NO.
D18–013	253,134
D03–031	253,135

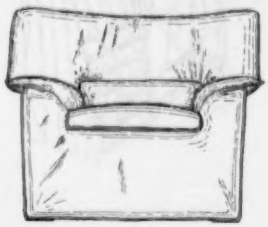
DESIGNS

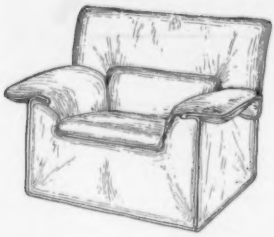
OCTOBER 9, 1979

253,076
STACKABLE TOTE TRAY
Goran S. Larson, Raketgatan 7, S-413 20 Goteborg, Sweden
Filed Oct. 22, 1976, Ser. No. 734,801
Claims priority, application Sweden, Apr. 22, 1976, 76892
Term of patent 3½ years
Int. Cl. D3—*99*
U.S. Cl. D3—68

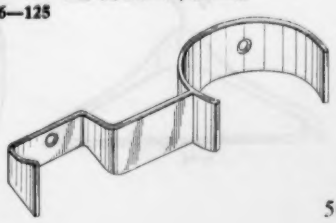
253,077
SUPPORT STAND FOR SOAP HOLDERS
Paul E. Wolf, Box 38C R.F.D., Pascoag, R.I. 02859
Filed Jun. 6, 1977, Ser. No. 804,086
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—28

253,078
ARM-CHAIR
Ambrogio Busnelli, Milan, Italy, assignor to B & B Italia S.p.A., Milan, Italy
Filed Mar. 16, 1977, Ser. No. 778,173
Claims priority, application Italy, Sep. 17, 1976, 22128/76[U]
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

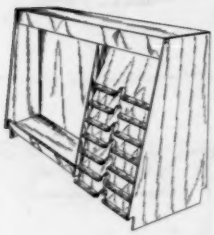




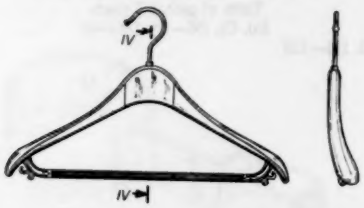
253,079
COMBINED TENNIS RACKET AND TENNIS BALL CAN HOLDER
Steven G. Hill, 238 Upland Rd., Redwood City, Calif. 94062
Filed Sep. 20, 1977, Ser. No. 835,174
Term of patent 7 years
Int. Cl. D6—*04;* D8—*08*
U.S. Cl. D6—125



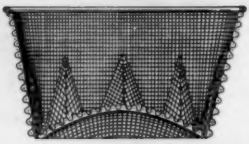
253,080
DISPLAY RACK
James L. Corrigan, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed Oct. 31, 1977, Ser. No. 847,314
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—188



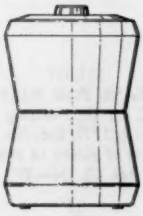
253,081
GARMENT HANGER
Mario Mainetti, Valdagno, Italy, assignor to Mainetti S.p.A., Castelgomberto, Italy
Filed Aug. 4, 1978, Ser. No. 931,105
Claims priority, application Italy, Feb. 6, 1978, 61912/78[U]
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—255



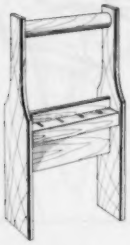
253,082
COFFEE FILTER SCREEN
J. D. Moncrief, 3139 Woodmark Ct., Sacramento, Calif. 95821
Filed May 11, 1977, Ser. No. 795,776
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47



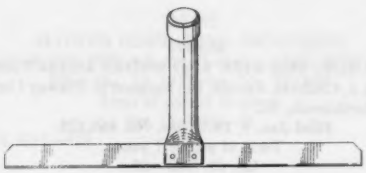
253,083
JUICE EXTRACTOR
Tang Bing Lam, Hoover Industrial Bldg., 3rd Floor, Block B, Nos. 26-38 Kwai Cheong Rd., N.T., Hong Kong, Hong Kong
Filed Jul. 7, 1977, Ser. No. 816,089
Claims priority, application United Kingdom, Jan. 11, 1977, 978498/77
Term of patent 3½ years
Int. Cl. D07—*04*
U.S. Cl. D7—49



253,084
CUTLERY HOLDER
Milton Berger, Englishtown, N.J., assignor to Washington Forge, Inc., Englishtown, N.J.
Filed Jul. 18, 1977, Ser. No. 816,904
Term of patent 14 years
Int. Cl. D07—*07*
U.S. Cl. D7—74



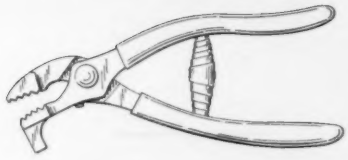
253,085
SCRAPER
Robert J. Mercer, 39 Western Ave., Mt. Albert, Auckland, New Zealand
Filed Apr. 15, 1977, Ser. No. 788,018
Claims priority, application New Zealand, Oct. 18, 1976, 14740
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—184



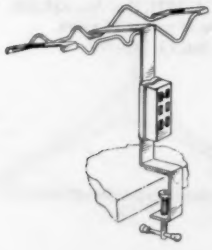
253,086
VEGETATION TRIMMER
Darrell W. Hinklin, and Randall A. Beihoffer, both of Richfield, Minn., assignors to The Toro Company, Minneapolis, Minn.
Filed Oct. 25, 1977, Ser. No. 841,681
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8

253,087
CAN OPENER
Frank C. Schuller, 7121 Park Crest Dr., Omaha, Nebr. 68128
Filed Oct. 4, 1977, Ser. No. 839,230
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—18

253,088
CANVAS STRETCHING PLIERS
Paul Levin, 1355 Market St., San Francisco, Calif. 94103
Filed May 5, 1977, Ser. No. 794,187
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—52



253,089
TOOL HOLDING FIXTURE
Kenneth Reiner, Long Beach, Calif., assignor to Kayline Enterprises, Inc., Long Beach, Calif.
Filed May 4, 1977, Ser. No. 793,795
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



253,090
REINFORCEMENT SPACER
Aubrey N. Sharley, Seaview Downs, Australia, assignor to Rapid Metal Developments Pty. Ltd., Australia
Filed Apr. 7, 1977, Ser. No. 785,866
Claims priority, application Australia, Oct. 15, 1976, 70345
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

253,091
COMBINED CLIP AND HOLDER OR THE LIKE
Ann K. Fritz, Woonsocket, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed May 10, 1978, Ser. No. 904,717
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395

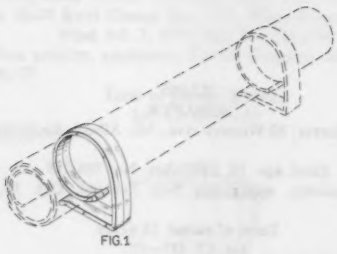
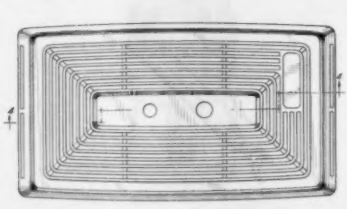


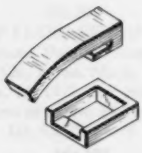
FIG.1

253,092
HOUSING FOR FIRE AND SMOKE DETECTOR
Frederick J. Conforti, Aurora, Ill., assignor to Pittway Corporation, Northbrook, Ill.
Filed Jan. 9, 1978, Ser. No. 868,125
Term of patent 7 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



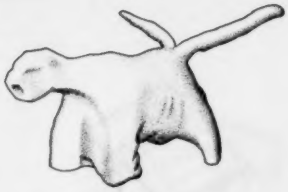
253,093
RING
Gabrielle Glueckselig, New York, N.Y., assignor to Artcarved Class Rings, Inc., New York, N.Y.
Filed Dec. 20, 1977, Ser. No. 862,348
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—35

253,094
JEWELRY CLASP
Gary Gudell, Brooklyn, N.Y., assignor to Jacoby-Bender, Inc., Woodside, N.Y.
Filed Apr. 7, 1977, Ser. No. 785,641
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—87



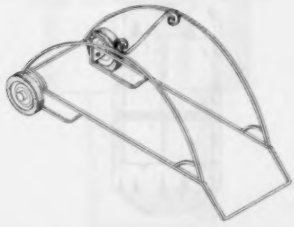
253,095
FLOWER DISPLAYING ORNAMENT
James A. Beatty, 1525 Ada St., Berkeley, Calif. 94703
Filed Jan. 13, 1977, Ser. No. 759,026
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—121

253,096
TWO-TAILED DOG SCULPTURE
Beatrice G. Driben, 20 NE. 146 St., Miami, Fla. 33161
Filed Dec. 22, 1977, Ser. No. 863,854
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158



253,097
BIRD-LIKE STATUETTE OR THE LIKE
Edith M. Phelps, 1307 Clairmont Ave., Cambridge, Ohio 43725
Filed Jul. 20, 1977, Ser. No. 817,837
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162

253,098
COMBINED LOG RACK AND CARRIER
Carl R. Morgan, 4617 David Dr., Bristol, Pa. 19007
Filed Sep. 14, 1977, Ser. No. 833,117
Term of patent 14 years
Int. Cl. D12—*02*; D7—*08*
U.S. Cl. D12—32

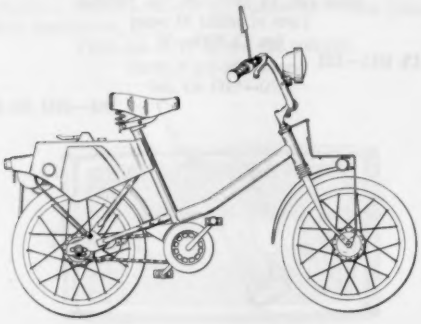


253,099
SPORTS CART
Charles C. Boisjolie, 2-91st La. NE., Blaine, Minn. 55434, and Thomas D. Oakleaf, 1814 E. Cottage Ave., St. Paul, Minn. 55101
Filed Feb. 27, 1978, Ser. No. 881,884
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—34

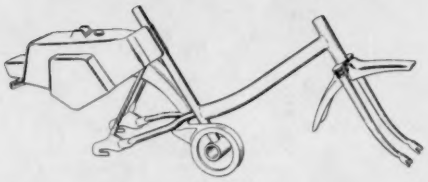
253,100
OBSERVATION ELEVATOR CAB
David J. Hesford, Belleville, N.J., assignor to Otis Elevator Company, New York, N.Y.
Filed Apr. 7, 1977, Ser. No. 785,622
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—54

253,101
THREE-WHEELED MOTOR VEHICLE
Stuart Pivar, 15 W. 67th St., New York, N.Y. 10023
Filed Apr. 20, 1978, Ser. No. 897,959
Term of patent 14 years
Int. Cl. D12—*11, 08*
U.S. Cl. D12—85

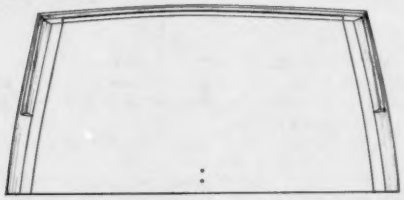
253,102
MOPED
Daniel G. Hahn, Olney, Ill., assignor to AMF Incorporated, White Plains, N.Y.
Filed Aug. 21, 1978, Ser. No. 935,211
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110

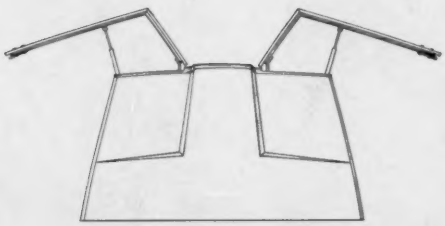


253,103
MOPED FRAME
Daniel G. Hahn, Olney, Ill., assignor to AMF Incorporated, White Plains, N.Y.
Division of Ser. No. 935,211, Aug. 21, 1978. This application Sep. 11, 1978, Ser. No. 941,345
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110

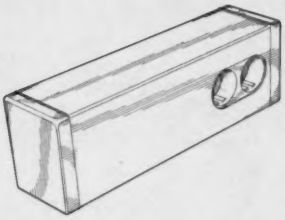


253,104
CAR TOP LUGGAGE CONTAINER
Robert G. Vallee, Grosse Pointe Woods, Mich., assignor to George P. Johnson Co., Arren, Mich.
Filed Nov. 11, 1977, Ser. No. 850,601
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

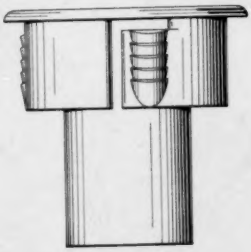




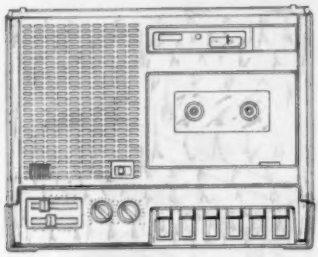
253,105
TERMINAL BOX WITH ELECTRICAL OUTLETS
Bengt E. Legerius, Nyköping, and Peter L. Maddock, Stockholm, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Mar. 7, 1977, Ser. No. 775,176
Claims priority, application Sweden, Sep. 8, 1976, 761745
Term of patent 7 years
Int. Cl. D13—*03*
U.S. Cl. D13—13

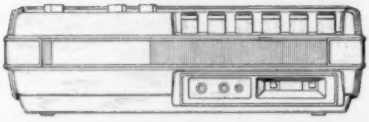


253,106
HOUSING FOR MAGNETIC CONTACT SWITCH COMPONENT
Thomas J. Holce, 8195 SW. Ernst Rd., Portland, Oreg. 97225, and Charles M. Huckins, 12200 SW. 116th Ave., Tigard, Oreg. 97223
Filed Jun. 30, 1977, Ser. No. 812,004
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32

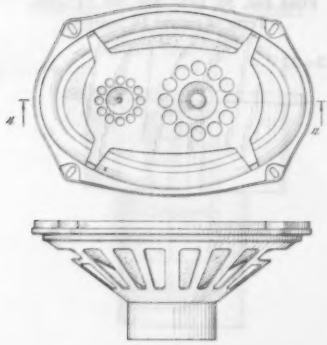


253,107
TAPE PLAYER OR SIMILAR ARTICLE
Richard Culbertson, Manlius, N.Y., assignor to General Electric Company
Filed Oct. 3, 1977, Ser. No. 838,932
Term of 14 patent years
Int. Cl. D14—*01*
U.S. Cl. D14—6

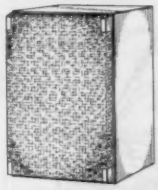




253,108
LOUDSPEAKER
Donald S. Schroeder, Barrington, Ill., assignor to Pemcor, Inc., Westchester, Ill.
Filed Jun. 13, 1977, Ser. No. 806,006
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—30

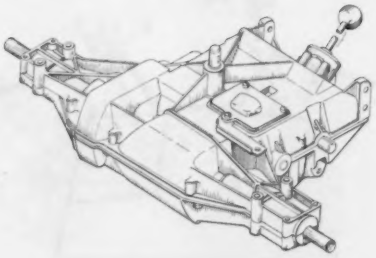


253,109
SPEAKER BOX WITH REMOVABLE GRILL
Takashi Kashidaira, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Jul. 22, 1977, Ser. No. 818,031
Claims priority, application Japan, Mar. 24, 1977, 52-10527
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—34

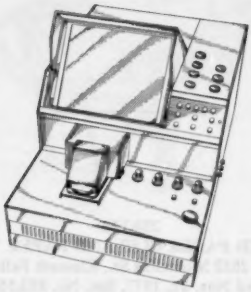


253,110
CHECK OR CREDIT CARD VERIFICATION TERMINAL
Richard D. Randolph, 3212 Colfax, Pueblo, Colo. 81008
Filed Dec. 12, 1977, Ser. No. 859,317
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—43

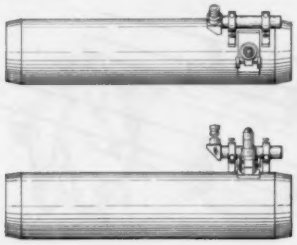
253,111
COMBINED TRANSMISSION AND AXLE UNIT
Hans Hauser, Fredericktown, and William J. Clayborne, Mount Vernon, both of Ohio, assignors to The J. B. Foote Foundry Co., Fredericktown, Ohio
Filed Jul. 25, 1977, Ser. No. 818,320
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—149



253,112
PHOTOGRAPHIC ENLARGING APPARATUS
Wilmuth Pramstraller, Bressanone, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate, Bolzano-Bozen, Italy
Filed Sep. 30, 1977, Ser. No. 838,259
Claims priority, application Italy, Apr. 19, 1977, 6710/77[U]
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



253,113
TELESCOPE
Peter W. Bressler, Philadelphia, Pa., assignor to Edmund Scientific Company, Barrington, N.J.
Filed Sep. 2, 1977, Ser. No. 830,362
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D16—60



253,114
METRIC CONVERTER SLIDE RULE
William Hackemann, Shelbyville, Tenn., assignor to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Dec. 5, 1977, Ser. No. 857,864
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D18—9

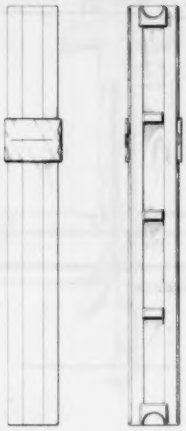
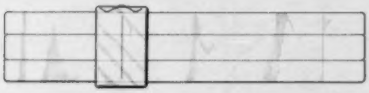
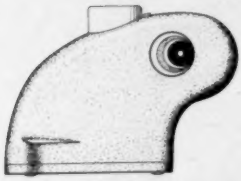


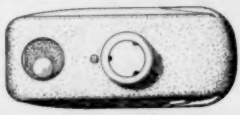
FIG. 1 FIG. 3

253,115
METRIC CONVERTER SLIDE RULE
William Hackemann, Shelbyville, Tenn., assignor to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Dec. 5, 1977, Ser. No. 857,865
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D18—9

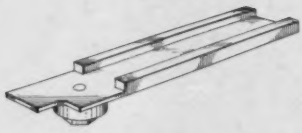


253,116
DEVICE FOR MOVING A WRITING INSTRUMENT IN A REPETITIVE PATTERN
Akio Tsuyuki, Gardena, Calif., assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed May 23, 1977, Ser. No. 799,465
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—35



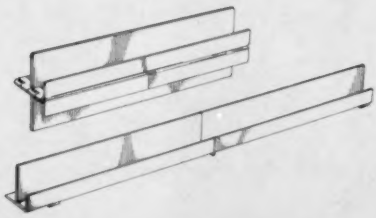


253,117 or similar article
SCRIBING RULE GUIDE
Joseph L. Knight, P.O. Box 150, Knox, Pa. 16232
Filed Nov. 21, 1977, Ser. No. 853,634
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—35



253,118
COMBINED PAPER CLIP AND PAPER WEIGHT
Roger D. West, 2822 Montelius St., Klamath Falls, Oreg. 97601
Filed Nov. 21, 1977, Ser. No. 853,554
Term of patent 7 years
Int. Cl. D19—*02*
U.S. Cl. D19—86

253,119
FOLDABLE DOCUMENT HOLDER
William Lamont, 4400 W. Missouri, #110, Glendale, Ariz. 85301
Filed Jul. 11, 1977, Ser. No. 814,785
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—90



253,120

PINBALL GAME CABINET

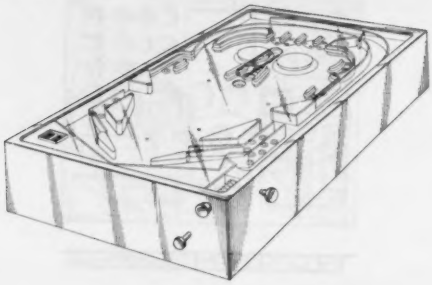
Edward B. Bretschger, Cos Cob, Conn., assignor to Louis Marx & Co., Inc., Stamford, Conn.

Filed Feb. 10, 1978, Ser. No. 876,793

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D21—9



253,121

TOY CONSTRUCTION PIECE

Hiroyuki Hida, Tokyo, Japan, assignor to Mitsubishi Pencil Co. Ltd., Tokyo, Japan

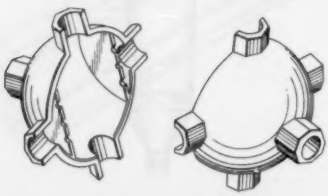
Filed Feb. 11, 1976, Ser. No. 657,255

Claims priority, application Japan, Aug. 30, 1975, 50-35106; Aug. 30, 1975, 50-35108; Aug. 30, 1975, 50-35110

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D21—108



253,122

DOLL

Barbara R. Smoloff, 5303 Northfield Rd., Bedford Heights, Ohio 44146

Filed Jan. 10, 1978, Ser. No. 868,470

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D21—166

253,123

TOILET DETERGENT DISPENSER

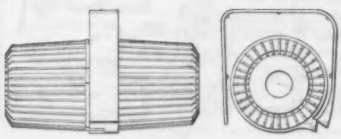
David A. Jones, Dayton, Ohio, assignor to The Drackett Company

Filed Jun. 2, 1977, Ser. No. 802,742

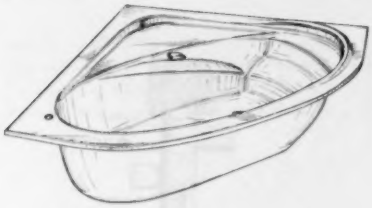
Term of patent 14 years

Int. Cl. D23—*01*

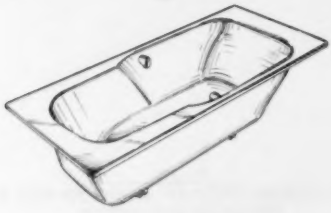
U.S. Cl. D23—3



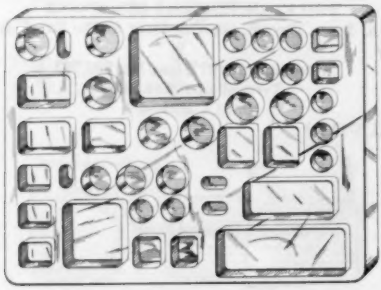
253,124
CORNER BATHTUB
André Primault, Garches, France, assignor to Societe Generale de Fonderie, Paris, France
Filed Oct. 23, 1978, Ser. No. 953,358
Claims priority, application France, Apr. 21, 1978, 78 76506
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



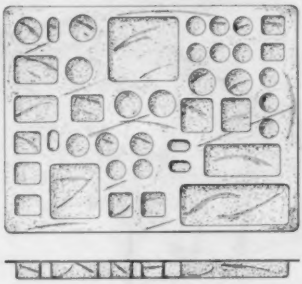
253,125
BATHTUB
André Primault, Garches, France, assignor to Societe Generale de Fonderie, Paris, France
Filed Oct. 23, 1978, Ser. No. 953,541
Claims priority, application France, Apr. 21, 1978, 78 76506
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



253,126
NECROPSY BOARD FOR SMALL ANIMALS
Hedwig Baxter, West Chazy, N.Y., assignor to American Home Products Corp. (Del.), New York, N.Y.
Filed Apr. 18, 1977, Ser. No. 788,170
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—31



253,127
NECROPSY BOARD FOR SMALL ANIMALS
Hedwig Baxter, West Chazy, N.Y., assignor to American Home Products Corp. (Del.), New York, N.Y.
Division of Ser. No. 788,170, Apr. 18, 1977. This application Sep. 6, 1978, Ser. No. 940,043
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—31



253,128
CONTAINER FOR INJECTABLE SUBSTANCE
Dominick B. Attanasio, Ridgefield, Conn., assignor to Howmedica, Inc., New York, N.Y.
Filed Oct. 31, 1977, Ser. No. 847,313
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—56

253,129

ULTRASONIC NEBULIZER

Herbert Marloth, Siegertsbrunn, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgerate GmbH, Munich, Fed. Rep. of Germany

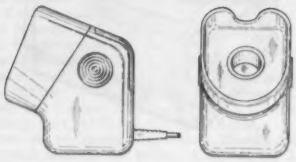
Filed Feb. 4, 1977, Ser. No. 765,791

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 4552

Term of patent 14 years

Int. Cl. D24—*02*

U.S. Cl. D24—62



253,130

FLOOR BEARER FOR USE IN A MOTOR VEHICLE

Edward G. Broadbent, 91 Park La., Sandbach, Cheshire, CW119EE, England

Filed Jan. 6, 1978, Ser. No. 867,569

Claims priority, application United Kingdom, Dec. 3, 1977, 982481/77

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—74

253,131

VERTICAL DOOR END FRAME FOR A MOTOR VEHICLE

Edward G. Broadbent, 91 Park La., Sandbach, Cheshire, CW119EE, England

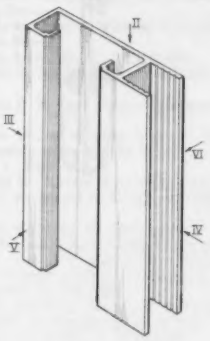
Filed Jan. 6, 1978, Ser. No. 867,567

Claims priority, application United Kingdom, Dec. 3, 1977, 982483/77

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—76



253,132

TILE

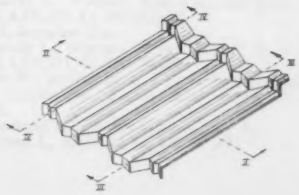
Herbert A. Martin, Hamilton, New Zealand, assignor to Rolls Gerard Tile Company Limited, Auckland, New Zealand

Filed Mar. 28, 1977, Ser. No. 782,093

Term of patent 14 years

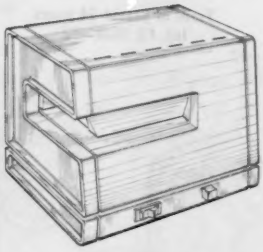
Int. Cl. D25—*01*

U.S. Cl. D25—92



253,133
COMBINED POLE LAMP AND PLANTER
Charles T. Wise, 209 Magnolia Ave., Pasadena, Md. 21122
Filed Sep. 15, 1977, Ser. No. 833,580
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 D

253,134
PRINTER
Luigi DiBenedetto, El Segundo, Calif., assignor to TRW Inc.
Filed Jun. 15, 1977, Ser. No. 806,626
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—13



253,135
COMBINED CHILD CARRIER AND SHOULDER BAG
Jeanette N. Fontana, 86 E. Passaic St., Rochelle Park, N.J. 07662
Filed Nov. 16, 1977, Ser. No. 851,969
Term of patent 7 years
Int. Cl. D3—*01*
U.S. Cl. D3—31

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TO WHOM

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Akimov, Igor M.: *See*—
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Strike, Donald P.; and Kao, Wenling, 4,170,710, Cl. 562-503.000.

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Balding, David P.; and Menayan, Victor V., 4,170,421, Cl. 366-144.000.
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Blazek, William S.; Piwonka, Thomas S.; Jackson, James D.; and Atanmo, Philip N., to TRW Inc. Mold assembly and method of making the same. 4,170,256, Cl. 164-26.000.

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Blount, David H. Process for the production of polyisocyanate silicate solid or cellular solid products. 4,170,697, Cl. 521-82.000.

Blumbergs, John H.: *See—*
Finley, Joseph H.; Blumbergs, John H.; and Erickson, Clifford A., 4,170,566, Cl. 252-99.000.

Bly, Vincent T., to United States of America, Army. Orthogonal active-passive array pair matrix display. 4,170,771, Cl. 340-781.000.

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Bock, Erich, to Schubert and Salzer. Method and apparatus for piecing an entwined yarn. 4,170,101, Cl. 57-6.000.

Boehm, Helmut, to United States of America, Navy. Parachute attachment swivel. 4,170,424, Cl. 403-164.000.

Boeing Company, The: *See—*
Fitzsimmons, George W.; Robinson, Lawrence W.; and Takeuchi, Jim S., 4,170,773, Cl. 343-6.50R.
Kennedy, James C.; and Woodmansee, Wayne E., 4,170,145, Cl. 73-620.000.
Lang, John M., 4,170,292, Cl. 198-746.000.

Boms, Heinz-Jurgen: *See—*
Ries, Karl; Kaiser, Dieter; Quaye, Mesa; Boms, Heinz-Jurgen; and Jannsen, Klaus-Uwe, 4,170,143, Cl. 73-609.000.

Booman, Glenn L.; and Phelps, Frank R., to United States of America, Energy. Coaxial cavity for measuring level of liquid in a container. 4,170,135, Cl. 73-290.00R.

Borror, Phillip E.; and Kwiatkowski, Jerome A., to Ball Corporation. Hollow container fault detector. 4,170,130, Cl. 73-49.100.

Bosse, Robert W., to Groov-Pin Corporation. Method of making lobular internally and externally threaded insert. 4,170,050, Cl. 10-10.00R.

Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Coating compositions comprising aqueous dispersions of quaternary ammonium base group-containing polymers and a curing agent. 4,170,579, Cl. 260-29.2TN.

Botcherby, Stephen C. L.; and Fitzherbert, Jeremy A., to Decca Limited. Vibratile optical boresight. 4,170,397, Cl. 350-6.300.

Bott, John A. Vehicle article carrier. 4,170,322, Cl. 244-326.000.

Bottger, Bernard J., to General Electric Company. Refrigerator cabinet construction. 4,170,391, Cl. 312-214.000.

Bourbon, Jean, to Societe Anonyme: Tournerie du Jura-Ets A. Bourbon & Fils. System for the housing and display of plane data carriers. 4,170,423, Cl. 402-70.000.

Bourlier, Jacques C. Tooth for rotary drilling tool for drilling foundations. 4,170,267, Cl. 175-409.000.

Bouygues: *See—*
Montacie, Marcel, 4,170,383, Cl. 299-56.000.

Boving, Hans: *See—*
Alder, Hanspeter; and Boving, Hans, 4,170,533, Cl. 204-243.00R.

Bowers, Mark C., to Sun Electric Corporation. Amplitude detection circuit. 4,170,140, Cl. 73-462.000.

Bowman, David F., to RCA Corporation. Frequency-scanned antenna. 4,170,778, Cl. 343-771.000.

Boyama, Kimihiro, to Kokusan Denki Co., Ltd. Ignition system for a multicylinder internal combustion engine. 4,170,207, Cl. 123-148.0CC.

Bozzelli, John W.: *See—*
Morris, Nancy J.; and Bozzelli, John W., 4,170,650, Cl. 424-250.000.

BP Chemicals Limited: *See—*
Kirkwood, Kenneth C., 4,170,568, Cl. 252-430.000.

Bradford, Lovell O. Barbecue. 4,170,173, Cl. 99-341.000.

Brandman, Harold A.; Freudewald, Joachim E.; Manowitz, Milton; Nikawitz, Edward J.; and Sharpell, Frederick H., Jr., to Givaudan Corporation. Iodopropargyl pyridyl and picolinyl ethers and thioethers as paint fungicides. 4,170,704, Cl. 546-290.000.

Branscome, Kenneth M.; Morgan, Barrie O.; and Carter, Merlon B., to Datotek, Inc. Digital cryptographic system and testing thereof. 4,170,714, Cl. 178-22.000.

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Seidel, Gunther; and Schmieder, Christian, 4,170,060, Cl. 30-43.920.

Bredlau, Kenneth A. Amusement device. 4,170,354, Cl. 273-153.00R.

Breininger, J. Shannon; and Greenberg, Charles B., to PPG Industries, Inc. Heat treatment of electrolessly deposited cuprous oxide coating. 4,170,461, Cl. 65-60.00D.

Breisch, John H., to Midland-Ross Corporation. Gas powered motor and system. 4,170,167, Cl. 91-491.000.

Brendle, Ralph N., to Milliken Research Corporation. Refrigerants colored for leak indication with substituted anthraquinone dyes. 4,170,564, Cl. 252-68.000.

British Cellophane Limited: *See—*
Huke, Peter N., 4,170,304, Cl. 206-597.000.

British Petroleum Company Limited, The: *See—*
Honour, David, 4,170,551, Cl. 210-27.000.

Brooking, Hurley R.: *See—*
Beasley, Marion W.; Swenson, Dale R.; Moore, Sidney E.; Brooking, Hurley R.; and Carroll, Harlan L., 4,170,170, Cl. 93-37.00R.

Brorein, William J.; and Tattanelli, Robert, to General Cable Corporation. Apparatus and method for assembling communications cable containing fiber optic conductors. 4,170,510, Cl. 156-432.000.

Brown, Abraham H. Modular structural member. 4,170,425, Cl. 403-296.000.

Brown, William E.; and Tsang, Floris Y., to Dow Chemical Company, The. Selective plugging of broken fibers in tubesheet-hollow fiber assemblies. 4,170,695, Cl. 429-193.000.

Bruckbauer, Gerald J.: *See—*
Hahn, Ernest A.; Murphy, Gary F., deceased; and Bruckbauer, Gerald J., 4,170,663, Cl. 427-44.000.

Bruml, Norman A. Hinged cover carton. 4,170,327, Cl. 229-44.00R.

Brunner, Erich: *See—*
Deubzer, Bernward; and Brunner, Erich, 4,170,610, Cl. 525-100.000.

Buchanan, Jack W.; and Lindner, Daniel J., to Goodyear Tire & Rubber Company, The. White sidewall tire. 4,170,503, Cl. 156-116.000.

Budden, Renke: *See—*
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Budden, Renke; and Bahlsen, Jacqueline, 4,170,649, Cl. 424-244.000.

Buggele, Alvin E. Fluid refining method. 4,170,522, Cl. 203-87.000.

Bunker Ramo Corporation: *See—*
Koegel, Ralph A., 4,170,149, Cl. 74-339.000.

Bunsick, Gordon E. Device for correcting the posture of a human foot. 4,170,233, Cl. 128-586.000.

Burckardt, Karl H.: *See—*
Bahr, Dietrich J.; Burckardt, Karl H.; and Spruth, Wilhelm G., 4,170,779, Cl. 346-139.00C.

Burke, Ernest L.: *See—*
Elson, Edward E.; Burke, Ernest L.; and Rogers, G. William, 4,170,228, Cl. 128-725.000.

Busch, Heinrich; and Zander, Eberhard, to GES Gesellschaft fur Elektrischen Strassenverkehr mbH. System for determining and calculating the work done by a mobile electrical machine at an energy supply station. 4,170,752, Cl. 320-44.000.

Buschbom, Floyd E.; Hansen, Glen D.; and Paulson, Jerome T., to Veda, Inc. Silo unloader with leveling and drive structure. 4,170,385, Cl. 406-59.000.

Butera, Anthony W. Calibrated oil burner filter paper. 4,170,127, Cl. 73-28.000.

Butler, William R.: *See—*
Roddy, Joseph T.; and Butler, William R., 4,170,057, Cl. 29-596.000.

Butseniex, Imant E.; Levina, Margarita Y.; Prostyakov, Alexandr A.; Stolov, Mikhail Y.; Sharamkin, Vladimir I.; and Scherbinin, Eduard V. Channel-type induction furnace. 4,170,713, Cl. 13-29.000.

Button, Millard J. Folding table structure. 4,170,182, Cl. 108-106.000.

Buzza, Edmund E.; and Lillig, John E., to Beckman Instruments, Inc. Method for checking isolation between titration and electrochemical measuring systems of a chemical analyzer. 4,170,523, Cl. 204-1.00T.

Byam, Erwin B.: *See—*
O'Keefe, George F.; Roy, Donald A.; and Byam, Erwin B., 4,170,051, Cl. 10-12.500.

C. E. Equipment, Inc.: *See—*
Tatum, Joe F., 4,170,532, Cl. 204-196.000.

C. Eugen Maier Metallverarbeitung GmbH, Firma: *See—*
Idler, Gustav, 4,170,283, Cl. 193-45.000.

C. R. Bard, Inc.: *See—*
Elson, Edward E.; Burke, Ernest L.; and Rogers, G. William, 4,170,228, Cl. 128-725.000.

Cabot Corporation: *See—*
Doppler, Leonard H., 4,170,486, Cl. 106-307.000.

Calamari, Timothy A., Jr.: *See—*
Harper, Robert J., Jr.; Calamari, Timothy A., Jr.; and Schreiber, Sidney P., 4,170,670, Cl. 427-341.000.

California Institute of Technology: *See—*
Rembaum, Alan; Gupta, Amitava; and Volksen, Willi, 4,170,685, Cl. 428-402.000.

California Processing Machinery: *See—*
Silvestrini, Jesus A., 4,170,660, Cl. 426-485.000.

Callahan, Andrew C.: *See—*
Pridham, Roger G.; Callahan, Andrew C.; and Mucci, Ronald A., 4,170,766, Cl. 367-135.000.

Cambelt International Corporation: *See—*
Campbell, David R., 4,170,293, Cl. 198-861.000.

Camp, John; Toelle, Alvin D.; and Wen, Gene Y., to Bendix Corporation, The. Dual mode hybrid control for electronic fuel injection system. 4,170,201, Cl. 123-32.0EE.

Campbell, David R., to Cambelt International Corporation. Enclosed conveyor. 4,170,293, Cl. 198-861.000.

Camsco, Inc.: *See—*
Van Tyne, Richard G.; Sanders, Weldon A., Jr.; De La Matyr, Richard D.; and Gates, David L., 4,170,419, Cl. 356-431.000.

Candler, Nigel D. Q., to Sigmund Pulsometer Pumps Limited. Screw pumps with modular construction. 4,170,436, Cl. 415-73.000.

Canon Kabushiki Kaisha: *See—*
Taguchi, Tatsuya; Iura, Yukio; Takishima, Yoshiyuki; and Fullagar, David, 4,170,411, Cl. 354-24.000.

Cappellini, Mario; and Zucchi, Dario, to Binishells New Systems Limited. Method and apparatus for erecting substantially dome-like building structures. 4,170,093, Cl. 52-741.000.

Caron, Patrick; and Manier, Francis, to Honeywell Inc. Recording head for multipoint recorder. 4,170,780, Cl. 346-141.000.

Carr, Richard P., to Sherwin-Williams Company, The. Purification of triazoles. 4,170,521, Cl. 203-6.000.

Carroll, Harlan L.: *See—*
Beasley, Marion W.; Swenson, Dale R.; Moore, Sidney E.; Brooking, Hurley R.; and Carroll, Harlan L., 4,170,170, Cl. 93-37.00R.
Carter, Merlon B.: *See—*
Branscome, Kenneth M.; Morgan, Barrie O.; and Carter, Merlon B., 4,170,714, Cl. 178-22.000.
Casavant, A. R. Reflector and drum. 4,170,162, Cl. 84-453.000.
Case, Barton C.: *See—*
Kroplinski, Thaddeus F.; and Case, Barton C., 4,170,559, Cl. 210-321.00A.
Case, Nelson S.; and Wyatt, Danny L., to Eastman Kodak Company. Photographic color developer compositions. 4,170,478, Cl. 96-66.400.
Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,170,105, Cl. 58-23.00R.
Caso, Felipe S. Body supported canopy. 4,170,242, Cl. 135-5.00C.
Castro, Mario J. M.: *See—*
Moreno, Miguel A. P.; Cil, Jorge A.; Montero, Justo B.; Novais, Guillermo B.; Morales, Jose A. R.; Montalvo, Fernando C.; Rivero, Armando A.; Castro, Mario J. M.; and Suarez, Jacinto F., 4,170,098, Cl. 56-13.900.
Catanzarite, Vincent O. Coating for lithium anode, thionyl chloride active cathode electrochemical cell. 4,170,693, Cl. 429-48.000.
Caterpillar Tractor Co.: *See—*
Congram, Sam R.; and Corkill, John M., 4,170,203, Cl. 123-122.0AB.
Windish, Willis E.; and Winzeler, James E., 4,170,152, Cl. 74-606.00R.
Caves, Robert B.; and Crane, Walton B. Box and blank for forming the box. 4,170,313, Cl. 220-7.000.
Chadwick, Curt H.: *See—*
Radecki, Dan J.; and Chadwick, Curt H., 4,170,763, Cl. 331-94.50D.
Chaiken, Robert F.: *See—*
Lee, Calvin K.; and Chaiken, Robert F., 4,170,668, Cl. 427-223.000.
Chambley, Phillip W.: *See—*
Norris, Alan H.; and Chambley, Phillip W., 4,170,103, Cl. 57-293.000.
Champion International Corporation: *See—*
Dorn, Gary H., 4,170,298, Cl. 206-326.000.
Chang, Robert W. H.: *See—*
Engel, Michael R.; Chang, Robert W. H.; and LaFleur, Linda L., 4,170,636, Cl. 424-52.000.
Chapelet, Gilbert; Knoche, Hubert; and Marie, Gilbert, to Entreprise de Recherches et d'Activities Petrolieres (E.R.A.P.). Lubricating compositions with lactam or thiolactam-containing copolymers. 4,170,561, Cl. 252-51.50A.
Charles E. Green & Sons, Inc.: *See—*
McDonald, Walter; and Seitel, Norbert J., 4,170,289, Cl. 198-479.000.
Chase, Gordon G.; Harlow, Richard A.; and Gupta, Viney K., to Ford Aerospace & Communications Corp. Hermetically sealed alkali metal battery container. 4,170,694, Cl. 429-176.000.
Chemische Werke Huls Aktiengesellschaft: *See—*
Doerffel, Joerg; and Haneklaus, Karl-Heinz, 4,170,580, Cl. 260-29.40R.
Hegenberg, Peter, deceased; Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helmut; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, 4,170,588, Cl. 260-45.80N.
Chen, Yew-Tsung, to Pitney-Bowes. Powder metal composition. 4,170,474, Cl. 75-251.000.
Cherubim, Martin: *See—*
Josten, Friedrich; Cherubim, Martin; and Striso, Rainer, 4,170,611, Cl. 525-494.000.
Chevron Research Company: *See—*
Lowe, Warren, 4,170,560, Cl. 252-47.500.
Miller, Stephen J., 4,170,544, Cl. 208-96.000.
Chicago Switch, Inc.: *See—*
Farrell, Guy M., 4,170,725, Cl. 200-676.000.
Chronberg, Sten, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method and machine for manufacturing a plate-like material made from agglomerated particles and in particular ceramic products obtained thereby. 4,170,542, Cl. 204-300.00R.
Chu, Nori Y. C.; and Piusz, Peter G., to American Optical Corporation. Photochromic mercury complexes of asymmetrical diarylthiocarbazones. 4,170,567, Cl. 252-300.000.
Ciba-Geigy Corporation: *See—*
Robertson, George H.; Rooney, Robert L.; and Todd, Robert B., 4,170,487, Cl. 106-309.000.
Cier, Andre: *See—*
Gero, Stephan; Mercier, Daniel; Olesker, Alain; and Cier, Andre, 4,170,643, Cl. 424-181.000.
Cil, Jorge A.: *See—*
Moreno, Miguel A. P.; Cil, Jorge A.; Montero, Justo B.; Novais, Guillermo B.; Morales, Jose A. R.; Montalvo, Fernando C.; Rivero, Armando A.; Castro, Mario J. M.; and Suarez, Jacinto F., 4,170,098, Cl. 56-13.900.
Citizen Watch Company Limited: *See—*
Yamagata, Hisao, 4,170,104, Cl. 58-23.00R.
Clampitt, Bert H.; and Horstman, Donald E., to Gulf Oil Corporation. Plasticized butene-1 polymer compositions. 4,170,586, Cl. 260-33.6PQ.
Clapp, John W. M., to Thermoplastic Compounders Limited. Apparatus for cleaning containers. 4,170,241, Cl. 134-83.000.
Clark Equipment Company: *See—*
Wolfe, Robert W., 4,170,148, Cl. 74-337.500.
Clarke, John R.: *See—*
Weiss, Armin K.; and Clarke, John R., 4,170,662, Cl. 427-38.000.
Clasen, Richard H.: *See—*
Giglia, Robert D.; and Clasen, Richard H., 4,170,406, Cl. 350-357.000.
Clayton Mfg. Co.: *See—*
Gniewek, Stephen A.; and Olsen, Dick M., 4,170,131, Cl. 73-116.000.
Clements, Alan, to Ben Clements & Sons, Inc. Rack and tie-back clip assembly. 4,170,299, Cl. 206-342.000.
Clemson University: *See—*
Hood, Clarence E., Jr.; Alper, Yekutiel; and Webb, Byron K., 4,170,100, Cl. 56-328.0TS.
Cline, Harvey E.; Houston, Douglas E.; and Anthony, Thomas R., to General Electric Company. Near-surface thermal gradient enhancement with opaque coatings. 4,170,491, Cl. 148-1.500.
Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,170,490, Cl. 148-1.500.
Anthony, Thomas R.; and Cline, Harvey E., 4,170,496, Cl. 148-33.000.
Coca-Cola Company, The: *See—*
Richter, Simon J., 4,170,243, Cl. 137-240.000.
Codina, Jorge G.; Estelle, Weems E.; and Stussman, Gerald J., to General X-Ray Corporation. Portable X-ray unit. 4,170,735, Cl. 250-422.000.
Cole, Russell P. Cultivator. 4,170,265, Cl. 172-156.000.
Colgate Palmolive Company: *See—*
Barth, Jordan B., 4,170,635, Cl. 424-49.000.
Cordon, Martin; and Norfleet, James, 4,170,634, Cl. 424-49.000.
Collins, Michael H., to G. D. Searle & Co., Ltd. Ostomy appliances. 4,170,231, Cl. 128-283.000.
Collonia, Harald, to VDO, Adolf Schindling AG. Device for regulating the traveling speed of a motor vehicle. 4,170,274, Cl. 180-179.000.
Combustion Engineering, Inc.: *See—*
Luff, Donald G., 4,170,451, Cl. 432-234.000.
Commette, Denis S.: *See—*
Gusmer, Frederick E.; Commette, Denis S.; and Bairunas, Robert A., 4,170,440, Cl. 417-426.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
Grigg, Geoffrey W.; and Sasse, Wolfgang H. F., 4,170,640, Cl. 424-177.000.
Compagnie Francaise de Raffinage: *See—*
Atlani, Martial; Corso, Vincent; Wakselman, Claude; Loutaty, Roben; and Yacono, Charles, 4,170,547, Cl. 208-326.000.
Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris": *See—*
Mathieu, Francis D. A., 4,170,429, Cl. 405-195.000.
Computer Management Services, Inc.: *See—*
Keane, Gordon H., Jr., 4,170,092, Cl. 51-284.00E.
Cone Mills Corporation: *See—*
Farley, Arthur C., Jr., 4,170,250, Cl. 139-79.000.
Congram, Sam R.; and Corkill, John M., to Caterpillar Tractor Co. Intake and exhaust manifolds. 4,170,203, Cl. 123-122.0AB.
Conlon, Bartholomew F., Jr., to General Electric Company. Belt tracking system. 4,170,175, Cl. 101-1.000.
Conly, William A.: *See—*
Hansen, William A.; and Conly, William A., 4,170,219, Cl. 126-121.000.
Conti, Allen C. Method for pulling cable. 4,170,673, Cl. 427-401.000.
Conti, Joseph A., to Pitney-Bowes, Inc. Mail handling apparatus. 4,170,350, Cl. 271-274.000.
Continental Group, Inc., The: *See—*
Weierman, Robert J.; Merle, Joseph J.; Gordon, Gerald A.; Pan, Peter N. Y.; and Hernandez, Rafael J., 4,170,314, Cl. 220-260.000.
Contraves Goerz Corporation: *See—*
McNally, Paul F., 4,170,159, Cl. 83-562.000.
Conway, Gerard V., to General Electric Company. High voltage separable connector system with modified dwell position. 4,170,394, Cl. 339-111.000.
Cook, Edward H., Jr.: *See—*
Lazarz, Christine A.; Cook, Edward H., Jr.; and Scripa, Lesleigh V., 4,170,540, Cl. 204-296.000.
Cooper, Dean E.: *See—*
Durno, Ronald A.; and Cooper, Dean E., 4,170,147, Cl. 74-96.000.
Cooper Industries, Inc.: *See—*
Nelson, Arvid L., 4,170,164, Cl. 409-13.000.
Cordon, Martin; and Norfleet, James, to Colgate Palmolive Company. Modified abrasive system for dentifrices. 4,170,634, Cl. 424-49.000.
Corkill, John M.: *See—*
Congram, Sam R.; and Corkill, John M., 4,170,203, Cl. 123-122.0AB.
Corsette, Douglas F.; and Jedlick, Frank J. Vaned anti-vortex pool drain cover. 4,170,047, Cl. 4-293.000.
Corso, Vincent: *See—*
Atlani, Martial; Corso, Vincent; Wakselman, Claude; Loutaty, Roben; and Yacono, Charles, 4,170,547, Cl. 208-326.000.
Coulter Information Systems, Inc.: *See—*
Kuehnle, Manfred R.; and Hagenlocher, Arno K., 4,170,475, Cl. 96-1.00C.

Coupal, Bernard: *See—*
Lalancette, Jean-Marc; and Coupal, Bernard, 4,170,515, Cl. 162-92.000.

Covrad Limited: *See—*
Cowell, Timothy A. T., 4,170,122, Cl. 72-186.000.

Cowell, Timothy A. T., to Covrad Limited. Apparatus for making corrugated sheet material. 4,170,122, Cl. 72-186.000.

Cox, John T.; Garber, Michael B.; Jasper, Marilyn A.; and Longshore, Randolph E., to United States of America, Army. Photodiode and method of manufacture. 4,170,781, Cl. 357-30.000.

Crane, Robert, Jr.: *See—*
Yoder, Paul R., Jr.; Schlesinger, Eugene R.; and Crane, Robert, Jr., 4,170,401, Cl. 350-173.000.

Crane, Walton B.: *See—*
Caves, Robert B.; and Crane, Walton B., 4,170,313, Cl. 220-7.000.

Crano, John C., to PPG Industries, Inc. Process for preparing halogenated diaryl hydrogen phosphates. 4,170,614, Cl. 260-983.000.

Craven, John S., to Hewlett-Packard Company. Thermal conductivity cell with thick film seal. 4,170,126, Cl. 73-27.00A.

Crawford, John R.: *See—*
Cutter, Lois M.; Crawford, John R.; and Thompson, Gregory J., 4,170,626, Cl. 422-143.000.

Crawford, Wheeler C.; and Wilson, James R., to Texaco Inc. Bituminous-emulsion mineral aggregate compositions. 4,170,484, Cl. 106-281.00N.

Createchnic Patent AG: *See—*
Dubach, Werner F.; and Kessler, Hansruedi, 4,170,315, Cl. 220-281.000.

Creda Electric Limited: *See—*
Lane, Richard J.; and Ellis, Gordon, 4,170,729, Cl. 219-364.000.

Cremer, Joseph: *See—*
Wortmann, Joachim; Schonrogge, Burkhard; Cremer, Joseph; and Dany, Franz-Josef, 4,170,508, Cl. 156-308.000.

Creutz, Hans G., deceased (by Creutz, Katharina A., administratrix); and Herr, Roy W., to Oxy Metal Industries Corporation. Electroplating bath and process. 4,170,526, Cl. 204-55.00R.

Creutz, Katharina A., administratrix: *See—*
Creutz, Hans G., deceased; and Herr, Roy W., 4,170,526, Cl. 204-55.00R.

Criglar, John J.; and Petraki, Lawrence T., to Somatronics, Inc. Biofeedback device. 4,170,225, Cl. 128-733.000.

Cross, John F., to Energy Generation, Inc. Incinerating method and apparatus having selective, controlled movement of materials during combustion. 4,170,183, Cl. 110-268.000.

Crossley, Peter A., to Fairchild Camera and Instrument Corporation. Process for forming field dielectric regions in semiconductor structures without encroaching on device regions. 4,170,500, Cl. 148-187.000.

CSELT—Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Tamburelli, Giovanni, 4,170,758, Cl. 325-42.000.

Cumbers, David C., to Imperial Chemical Industries Limited. Nonwoven fabrics. 4,170,680, Cl. 428-195.000.

Cummins Engine Company, Inc.: *See—*
Downs, Ronald, 4,170,072, Cl. 33-172.00R.
Mathews, Will W., 4,170,528, Cl. 204-129.200.

Cunningham, Robert W.: *See—*
Kurtz, Abraham N.; Cunningham, Robert W.; and Naumann, Alfred W., 4,170,572, Cl. 252-455.00R.

Cutter, Lois M.; Crawford, John R.; and Thompson, Gregory J., to UOP Inc. Gas distribution apparatus for use with fluidized beds. 4,170,626, Cl. 422-143.000.

Daido Metal Company Ltd.: *See—*
Mori, Sanae, 4,170,469, Cl. 75-141.000.

Dainippon Ink and Chemicals, Inc.: *See—*
Mori, Kaoru; Tanaka, Hiro; Ozawa, Hirosi; and Murakami, Yoichi, 4,170,582, Cl. 260-29.6RW.

Dalomba, Muriel A.: *See—*
Flanders, Dale C.; Smith, Henry I.; and Dalomba, Muriel A., 4,170,512, Cl. 156-631.000.

Dando, Thomas O.: *See—*
Lemeshewsky, George P.; Dando, Thomas O.; Shope, Arthur R., Jr.; and Kuck, Kenneth D., 4,170,415, Cl. 355-22.000.

Daniher, Francis A.; and Oswald, Alexis A., to Exxon Research & Engineering Co. Addition of N,N-dichloro-N-acyl compounds to conjugated dienes and sulfamide products therefrom. 4,170,608, Cl. 260-556.00N.

Dany, Franz-Josef: *See—*
Wortmann, Joachim; Schonrogge, Burkhard; Cremer, Joseph; and Dany, Franz-Josef, 4,170,508, Cl. 156-308.000.

Danziger, Harry; Kaiser, Bernd-Ulrich; Rampart, Guido; and Schroter, Jurgen, to Bayer Aktiengesellschaft. Purification of ε-caprolactam. 4,170,592, Cl. 260-239.30A.

Daravingas, George V.: *See—*
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,170,632, Cl. 424-48.000.
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,170,633, Cl. 424-48.000.

Datotek, Inc.: *See—*
Branscome, Kenneth M.; Morgan, Barrie O.; and Carter, Merlon B., 4,170,714, Cl. 178-22.000.

Daughton, John W.; Gillett, Kenneth; Nelson, Frank; and Wilczek, Stephen P., to Xerox Corporation. Serial data communication system for a reproduction machine. 4,170,791, Cl. 364-900.000.

Davenport, John M., to General Electric Company. High frequency operation of miniature metal vapor discharge lamps. 4,170,746, Cl. 315-246.000.

Davis, Milton S. Bicycle accessory. 4,170,337, Cl. 248-475.00R.

Davis, Thomas J.: *See—*
Posakony, Gerald J.; Hildebrand, B. Percy; and Davis, Thomas J., 4,170,142, Cl. 73-603.000.

Dawson, Charles, to General Electric Company. Blown tube collapse frame assembly. 4,170,624, Cl. 264-564.000.

De La Matyr, Richard D.: *See—*
Van Tyne, Richard G.; Sanders, Weldon A., Jr.; De La Matyr, Richard D.; and Gates, David L., 4,170,419, Cl. 356-431.000.

Decca Limited: *See—*
Botcherby, Stephen C. L.; and Fitzherbert, Jeremy A., 4,170,397, Cl. 350-6.300.

Deere & Company: *See—*
Kittle, Carl E.; and Wittren, Richard A., 4,170,113, Cl. 60-427.000.

Deffeyes, Robert J.; and Tyler, Wesley R., to Graham Magnetics, Inc. Method of producing acicular metal crystal. 4,170,602, Cl. 260-439.00R.

Deggendorfer Werft und Eisenbau GmbH: *See—*
Laber, Walter; Vogl, Rudolf; and Fahrnschon, Wolfgang, 4,170,263, Cl. 165-158.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Marubashi, Kiyonobu, 4,170,613, Cl. 525-403.000.

De Santis, Charles M.: *See—*
Skudera, William J.; De Santis, Charles M.; and Ikrath, Kurt, deceased, 4,170,757, Cl. 325-32.000.

Desmarchais, Walter E.: *See—*
Meuschke, Robert E.; Desmarchais, Walter E.; and Katz, Leonard R., 4,170,517, Cl. 176-87.000.

Deubzer, Bernward; and Brunner, Erich, to Wacker-Chemie GmbH. Preparation of cross-linked modified organopolysiloxanes. 4,170,610, Cl. 525-100.000.

Deutsche Texaco Aktiengesellschaft: *See—*
Josten, Friedrich; Cherubim, Martin; and Striso, Rainer, 4,170,611, Cl. 525-494.000.

Diamond Shamrock Technologies S.A.: *See—*
Beer, Henri B.; and Muller, Theo L. H., 4,170,527, Cl. 204-96.000.

Diekmann, Manfred: *See—*
Selbach, Hans-Werner; and Diekmann, Manfred, 4,170,150, Cl. 74-410.000.

Diewald, Gunther, to Werkzeugmaschinenfabrik Oerlikon-Buhrle. Detonator containing octogen crystals for projectiles and method of manufacturing the same. 4,170,178, Cl. 102-29.000.

Ditty, Allan V.; and Shaffer, William B. Spiral meat slicer. 4,170,174, Cl. 99-538.000.

Dr. Beck & Co. A.G.: *See—*
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, 4,170,684, Cl. 428-379.000.

Doerffel, Joerg; and Haneklaus, Karl-Heinz, to Chemische Werke Huls Aktiengesellschaft. Coating composition. 4,170,580, Cl. 260-29.40R.

Dollar, David L.: *See—*
Scholes, Addison B.; Dollar, David L.; and Hurst, Robert L., 4,170,193, Cl. 118-627.000.

Domeniconi, Marcel, to Hinterkopf, Kurt G. Printing mechanism with drive for axially movable distributing roller. 4,170,176, Cl. 101-330.000.

Dominion Pharmacal, Inc.: *See—*
Olson, B. Newell, 4,170,229, Cl. 128-67.000.

Domore Office Furniture, Inc.: *See—*
Wheeler, Kenneth L., 4,170,382, Cl. 297-306.000.

Donley, Harold E., to PPG Industries, Inc. Method of making colored glass articles. 4,170,460, Cl. 65-30.00R.

Doppler, Leonard H., to Cabot Corporation. Carbon black compositions and black-pigmented compositions containing same. 4,170,486, Cl. 106-307.000.

Dorn, Gary H., to Champion International Corporation. "L" shaped contour carton. 4,170,298, Cl. 206-326.000.

Dorr-Oliver Incorporated: *See—*
Freeman, Mark P., 4,170,529, Cl. 204-180.00R.

Doss, Dwight E.: *See—*
Keeling, Michael C.; and Doss, Dwight E., 4,170,507, Cl. 156-245.000.

Double A Products Company: *See—*
Gill, Arthur W.; and Loup, Ronald L., 4,170,214, Cl. 137-269.000.

Dow Chemical Company, The: *See—*
Brown, William E.; and Tsang, Floris Y., 4,170,695, Cl. 429-193.000.
Morris, Nancy J.; and Bozzelli, John W., 4,170,650, Cl. 424-250.000.
Motes, John M., 4,170,591, Cl. 260-239.00E.
Rigterink, Raymond H., 4,170,657, Cl. 424-322.000.

Dow Corning Corporation: *See—*
Griffin, Howard E., 4,170,581, Cl. 260-29.40R.

Downs, Ronald, to Cummins Engine Company, Inc. Fuel injector adjustment fixture. 4,170,072, Cl. 33-172.00R.

Drag Specialties, Inc.: *See—*
Rudd, Thomas H.; and Preisler, James M., 4,170,260, Cl. 165-51.000.

Dreis & Krump Manufacturing Company: *See—*
MacGregor, Robert, 4,170,124, Cl. 72-389.000.

Dresser Engineering Company: *See—*
Ruth, Ralph G., 4,170,548, Cl. 208-351.000.

Dresser Industries, Inc.: *See—*
Randall, Russel R., 4,170,732, Cl. 250-264.000.

Dubach, Werner F.; and Kessler, Hansruedi, to Createchnic Patent AG. Closure for rigid and deformable containers. 4,170,315, Cl. 220-281.000.

Dubois, Robert A.; and Smith, George F., to Greif Bros. Corporation. Method of blow molding an all plastic drum and compression molding a projection thereon. 4,170,623, Cl. 264-534.000.

Dubs, Paul; and Kuntzel, Heiner, to Givaudan Corporation. Oxazolylalkyl-disulphides as flavorants. 4,170,594, Cl. 548-229.000.

Duchene, Rene. Method and device for controlling the geometry of two-wheeled vehicles. 4,170,070, Cl. 33-203.180.

Dunlop Limited: *See—*
Jackson, William L., 4,170,254, Cl. 152-353.00R.

Dunnery, David A.: *See—*
Kosseim, Alexander J.; Dunnery, David A.; and Atwood, Gilbert R., 4,170,628, Cl. 423-243.000.

Du Pont de Nemours, E. I., and Company: *See—*
Edwards, Donald W.; Kinard, Richard D.; Wirbisky, Theodore J.; and Angelucci, Richard J., 4,170,287, Cl. 198-657.000.
Lewis, Robert B., 4,170,347, Cl. 270-94.000.
Woo, Lecon, 4,170,141, Cl. 73-579.000.

Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Heterocyclic-methylthioalkyl-guanidines. 4,170,652, Cl. 424-263.000.

Durno, Ronald A.; and Cooper, Dean E., to United Technologies Corporation. Redundant flight control system. 4,170,147, Cl. 74-96.000.

Dynapac Maskin Aktiebolag: *See—*
Grane, Gunnar, 4,170,427, Cl. 404-133.000.

Dytek Corporation: *See—*
Graham, Raymond, 4,170,234, Cl. 128-303.140.

E M I Limited: *See—*
Woodruff, Royston F., 4,170,734, Cl. 250-402.000.

E. R. Squibb & Sons, Inc.: *See—*
Wade, Peter C.; and Vogt, Berthold R., 4,170,651, Cl. 424-258.000.

Eagar, Lee J. Beverage container. 4,170,320, Cl. 222-146.00C.

Eastman Kodak Company: *See—*
Case, Nelson S.; and Wyatt, Danny L., 4,170,478, Cl. 96-66.400.
Merrill, Stewart H.; and Santilli, Domenic, 4,170,563, Cl. 252-62.10L.
Weiss, Armin K.; and Clarke, John R., 4,170,662, Cl. 427-38.000.

Eder, Ulrich: *See—*
Weber, Alfred; Kennecke, Mario; Popper, Alfred; Muller, Rudolf; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Neef, Gunter; and Wiechert, Rudolf, 4,170,518, Cl. 435-55.000.

Edwards, Donald K.: *See—*
Marcus, Bruce D.; and Edwards, Donald K., 4,170,262, Cl. 165-105.000.

Edwards, Donald W.; Kinard, Richard D.; Wirbisky, Theodore J.; and Angelucci, Richard J., to Du Pont de Nemours, E. I., and Company. Magnetic auger. 4,170,287, Cl. 198-657.000.

Edwards, John R.; Rennie, George K.; Rosser, David A.; and Smart, Colin, to Lever Brothers Company. Method of applying a varnish layer to a printed surface and product made thereby. 4,170,681, Cl. 428-205.000.

Egan, William J., Jr.; Hanloser, Kurt J.; and Shadowen, James H., to United Technologies Corporation. Thrust augmentor having swirled flows for combustion stabilization. 4,170,109, Cl. 60-204.000.

Egashira, Kazumichi: *See—*
Katsui, Akinori; and Egashira, Kazumichi, 4,170,689, Cl. 428-457.000.

Eicher, Josef. Carriage insertable into the load space of a motor vehicle. 4,170,379, Cl. 296-20.000.

Ejima, Akio: *See—*
Kaito, Hiroyuki; Ohtani, Takashi; Iwaoka, Shoji; Oguchi, Yukio; Yano, Shuya; and Ejima, Akio, 4,170,467, Cl. 75-49.000.

Electric Power Research Institute, Inc.: *See—*
Posakony, Gerald J.; Hildebrand, B. Percy; and Davis, Thomas J., 4,170,142, Cl. 73-603.000.

Electronics for Medicine, Inc.: *See—*
Feldman, Charles L.; and Hubelbank, Mark, 4,170,227, Cl. 128-704.000.

Ellis, Gordon: *See—*
Lane, Richard J.; and Ellis, Gordon, 4,170,729, Cl. 219-364.000.

Ellwanger, Charles G.; and Pedersen, Harry, to Gleason Works, The. Apparatus for resharpening cutting blades for gear cutting machine. 4,170,091, Cl. 51-5.00D.

Elsner, Emil, to Korf-Stahl AG. Tiltable arc furnace. 4,170,712, Cl. 13-10.000.

Elson, Edward E.; Burke, Ernest L.; and Rogers, G. William, to C. R. Bard, Inc. Variable flow incentive spirometer. 4,170,228, Cl. 128-725.000.

Elson, Ian H.: *See—*
Spicer, Leonard A.; McGee, Derek J.; and Elson, Ian H., 4,170,687, Cl. 428-421.000.

Emerson Electric Co.: *See—*
Roddy, Joseph T.; and Butler, William R., 4,170,057, Cl. 29-596.000.

Energy Conversion Devices, Inc.: *See—*
Flasck, Richard, 4,170,728, Cl. 219-216.000.

Energy Generation, Inc.: *See—*
Cross, John F., 4,170,183, Cl. 110-268.000.

Energy Recycling Corporation Pty. Ltd.: *See—*
Lloyd, Robert; and Turner, Maxwell J., 4,170,312, Cl. 224-4.00B.

Engel, Michael R.; Chang, Robert W. H.; and LaFleur, Linda L., to Minnesota Mining and Manufacturing Company. Composition and method for inhibiting plaque formation. 4,170,636, Cl. 424-52.000.

Entreprise de Recherches et d'Activities Petrolieres (E.R.A.P.): *See—*
Chapelet, Gilbert; Knoche, Hubert; and Marie, Gilbert, 4,170,561, Cl. 252-51.50A.

Epstein, Kevin B. Water pipes with means for preventing water spillage. 4,170,237, Cl. 131-173.000.

Erickson, Clifford A.: *See—*
Finley, Joseph H.; Blumbergs, John H.; and Erickson, Clifford A., 4,170,566, Cl. 252-99.000.

Erickson, Paul M.: *See—*
Stimple, James R.; and Erickson, Paul M., 4,170,759, Cl. 325-51.000.

Ernest, Michael V.; and Maselli, James M., to W. R. Grace & Co. Rare earth and platinum group metal catalyst compositions. 4,170,573, Cl. 252-462.000.

Eshel, Abraham, to Ampex Corporation. Foil bearing. 4,170,389, Cl. 308-160.000.

Esquire, Inc.: *See—*
Holmes, Kenneth P., 4,170,747, Cl. 315-307.000.

Estelle, Weems E.: *See—*
Codina, Jorge G.; Estelle, Weems E.; and Stussman, Gerald J., 4,170,735, Cl. 250-422.000.

Estes, Judith K. Hospital bathtub. 4,170,045, Cl. 4-177.00R.

Etablissements Lachaussee, Societe Anonyme: *See—*
Lachaussee, Maurice, 4,170,284, Cl. 198-345.000.

Etlin, Vladimir N. Apparatus for electrostatic deposition. 4,170,194, Cl. 118-629.000.

Exxon Research & Engineering Co.: *See—*
Daniher, Francis A.; and Oswald, Alexis A., 4,170,608, Cl. 260-556.00N.
Goldstein, H. Lawrence; and Shaw, Henry, 4,170,447, Cl. 423-215.500.
Lipscomb, Thomas G., II; Morgan, Walter A.; and Bethea, Sam R., 4,170,543, Cl. 208-14.000.
Spenadel, Lawrence; and Banks, S. Alexander, 4,170,664, Cl. 427-44.000.

Fabrycy, Marian: *See—*
Michalski, Stanislaw; and Fabrycy, Marian, 4,170,753, Cl. 324-384.000.

Fahrnschon, Wolfgang: *See—*
Laber, Walter; Vogl, Rudolf; and Fahrnschon, Wolfgang, 4,170,263, Cl. 165-158.000.

Fairchild Camera and Instrument Corporation: *See—*
Crossley, Peter A., 4,170,500, Cl. 148-187.000.

Falcon Safety Products, Inc.: *See—*
Pappas, Michael; Witte, Paul A.; and Severud, Christopher N., Jr., 4,170,189, Cl. 116-106.000.

Fannin, Loyd W., to Stauffer Chemical Company. Novel substituted methylene bridged aluminum oligomers. 4,170,603, Cl. 260-448.00A.

Farley, Arthur C., Jr., to Cone Mills Corporation. Loom harness mechanism. 4,170,250, Cl. 139-79.000.

Farrell, Guy M., to Chicago Switch, Inc. Switch with sliding contactor. 4,170,725, Cl. 200-676.000.

Faulstich, Eugene W. Vehicle ladder rack. 4,170,331, Cl. 224-324.000.

Faxon, Robert L. Mist spray apparatus for air conditioner condenser. 4,170,117, Cl. 62-183.000.

Fayren, Jose M. Apparatus and method for offshore drilling at great depths. 4,170,266, Cl. 175-7.000.

Feeny, Richard W., to American Cyanamid Company. Herbicidal combinations. 4,170,464, Cl. 71-92.000.

Feldman, Charles L.; and Hubelbank, Mark, to Electronics for Medicine, Inc. Apparatus and method for ECG baseline shift detecting. 4,170,227, Cl. 128-704.000.

Feltman, Murray; and Fields, David L. Simulated dead bolt lock for deterring burglars. 4,170,120, Cl. 70-431.000.

Fencil, Carroll R., to Perkin-Elmer Corporation, The. Apparatus for analyzing coherent radiation. 4,170,416, Cl. 356-346.000.

Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., to Ayerst McKenna and Harrison Limited. Antidepressant naphthyloxy piperidino and pyrrolidino propanol ethers. 4,170,653, Cl. 424-267.000.

Fernand Piche Enterprises Limited: *See—*
Piche, Fernand J., 4,170,513, Cl. 156-656.000.

Fiedler, Willy A. Fuel distribution in internal combustion engines. 4,170,205, Cl. 123-139.0AS.

Fields, David L.: *See—*
Feltman, Murray; and Fields, David L., 4,170,120, Cl. 70-431.000.

Fierheller, Douglas E. Glider toy. 4,170,084, Cl. 46-79.000.

Finkin, Stephen E. Educational puzzles. 4,170,355, Cl. 273-155.000.

Finley, Joseph H.; Blumbergs, John H.; and Erickson, Clifford A., to FMC Corporation. Carboxylic/sulfonic anhydrides as peroxygen activators. 4,170,566, Cl. 252-99.000.

Fischer, William F.: *See—*
Armbruster, David C.; and Fischer, William F., 4,170,690, Cl. 428-447.000.

Fisher, Stanley F. Towel-dispensing golf bag insert. 4,170,317, Cl. 221-76.000.

Fitterer, George R. Apparatus for the direct conversion of solar energy into electricity and a combustible gas by galvanic means. 4,170,534, Cl. 204-248.000.

Fitzherbert, Jeremy A.: *See—*
Botcherby, Stephen C. L.; and Fitzherbert, Jeremy A., 4,170,397, Cl. 350-6.300.

Fitzsimmons, George W.; Robinson, Lawrence W.; and Takeuchi, Jim S., to Boeing Company, The. Precision approach sensor system for aircraft. 4,170,773, Cl. 343-6.50R.

Flanders, Dale C.; Smith, Henry I.; and Dalomba, Muriel A., to Massachusetts Institute of Technology. Method of manufacture of a soft-X-ray mask. 4,170,512, Cl. 156-631.000.

Flasck, Richard, to Energy Conversion Devices, Inc. Heat applying microfilm recording apparatus. 4,170,728, Cl. 219-216.000.

Fleming, James H.; and Rudin, Melvin, to Bactomatic, Inc. Mold for making impedance measuring module. 4,170,444, Cl. 425-123.000.

Flesher, Daniel J.; and Kingry, Gary W., to Procter & Gamble Company, The. Substrate article for cleaning fabrics. 4,170,565, Cl. 252-93.000.

Flexipane Limited: *See*—
Greengrass, Michael, 4,170,675, Cl. 428-109.000.

Flintab AB: *See*—
Nordstrom, Kjell H.; and Flinth, Rune N. A., 4,170,268, Cl. 177-163.000.

Flinth, Rune N. A.: *See*—
Nordstrom, Kjell H.; and Flinth, Rune N. A., 4,170,268, Cl. 177-163.000.

Floet, Wilhelmus F. W.; and Heijke, Hermanus N., to Amtac B.V. Apparatus for packaging an object. 4,170,097, Cl. 53-567.000.

FMC Corporation: *See*—
Finley, Joseph H.; Blumbergs, John H.; and Erickson, Clifford A., 4,170,566, Cl. 252-99.000.
Haley, Frank P., 4,170,245, Cl. 137-487.500.

Ford Aerospace & Communications Corp.: *See*—
Chase, Gordon G.; Harlow, Richard A.; and Gupta, Viney K., 4,170,694, Cl. 429-176.000.

Ford Motor Company: *See*—
Rao, V. Durga Nageswar; Rahnke, Christian J.; Fucinari, Carlo A.; and Vallance, James K., 4,170,620, Cl. 264-230.000.

Forsman, Lars O. Apparatus for transmission of measuring motion in gauging equipment. 4,170,068, Cl. 33-169.00R.

Four Star Corporation: *See*—
Ingram, Charles E., 4,170,377, Cl. 296-1.00S.

Fourcadier, Chantal: *See*—
Grollier, Jean-Francois; Monnais, Christian; and Fourcadier, Chantal, 4,170,452, Cl. 8-10.200.

Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., to Gulf Research and Development Company. Multistage residual oil hydrodesulfurization process with an interstage flashing step. 4,170,545, Cl. 208-210.000.

Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., to Gulf Research and Development Company. Multistage residual oil hydrodesulfurization process. 4,170,546, Cl. 208-210.000.

Freedman, Calvin. Modular connectors for cylindrical elements. 4,170,082, Cl. 46-29.000.

Freelander, I. Robert: *See*—
Freelander, Israel R.; and Krumholz, Jerrold J., 4,170,083, Cl. 46-29.000.

Freelander, Israel R.; and Krumholz, Jerrold J., to Freelander, I. Robert. Toy construction. 4,170,083, Cl. 46-29.000.

Freeman, Mark P., to Dorr-Oliver Incorporated. System and method for electric dewatering of solids suspension. 4,170,529, Cl. 204-180.00R.

Freitag, Dieter: *See*—
Schmidt, Manfred; Freitag, Dieter; and Nouvertne, Werner, 4,170,587, Cl. 260-37.0PC.

French, David W., to Johns-Manville Corporation. Assembly for forming the bell of a bell spigot joint. 4,170,448, Cl. 425-393.000.

Fresard, Marcel; and Raboud, Norbert, to Mefina S.A. Mechanism for the adjustment of the direction and of the amplitude of the movement of the transporting claw for material to be sewn on a sewing machine. 4,170,184, Cl. 112-317.000.

Freshcorn, Ivan G., to United Aircraft Products, Inc. Wastewater treatment method. 4,170,554, Cl. 210-50.000.

Freudewald, Joachim E.: *See*—
Brandman, Harold A.; Freudewald, Joachim E.; Manowitz, Milton; Nikawitz, Edward J.; and Sharpell, Frederick H., Jr., 4,170,704, Cl. 546-290.000.

Freyberger, Heidelore, heir: *See*—
Hegenberg, Peter, deceased; Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helmut; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, 4,170,588, Cl. 260-45.80N.

Fridrich, Elmer G., to General Electric Company. Method and apparatus for dispensing salt powder as pellets in lamp making. 4,170,619, Cl. 264-113.000.

Frisbie, Milo W.; and Swapp, Mavin C., to Motorola, Inc. Lift and feed mechanism for high speed integrated circuit handler. 4,170,290, Cl. 198-524.000.

Fritz, Brian E.; and Pipersky, Emil, to Fritz, Brian E. Plant support stake. 4,170,088, Cl. 47-47.000.

Fruehauf Corporation: *See*—
Banerjea, Tara N., 4,170,376, Cl. 292-218.000.

Frusztajer, Boruch B.; and Lerner, Moisey M. Apparatus and method for supplying direct current with superimposed alternating current. 4,170,739, Cl. 307-2.000.

Fucinari, Carlo A.: *See*—
Rao, V. Durga Nageswar; Rahnke, Christian J.; Fucinari, Carlo A.; and Valiance, James K., 4,170,620, Cl. 264-230.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Kodama, Masayuki; Takano, Toshio; and Makishima, Sadao, 4,170,273, Cl. 180-233.000.

Fuji Photo Film Co., Ltd.: *See*—
Ikenoue, Shinpei; Masuda, Takao; Katsuyama, Harumi; Sekikawa, Nobuyoshi; Shishido, Tadao; and Sakai, Nobuo, 4,170,480, Cl. 96-114.100.
Usami, Toshimasa, 4,170,479, Cl. 96-68.000.

Fuji Xerox Co., Ltd.: *See*—
Sadamatsu, Shigeru; and Oka, Kozo, 4,170,476, Cl. 96-1.50N.

Fujie, Hideo: *See*—
Iida, Mitsuhiko; Kato, Yasuo; Baba, Kazuyuki; and Fujie, Hideo, 4,170,177, Cl. 101-365.000.

Fujii, Sumihide; Fukinbara, Hazime; Mizutani, Katuzi; Nishibe, Minoru; and Ishii, Yoshitomo, to Kobe Steel, Ltd. Surface treatment for metal according to fluidized bed system. 4,170,494, Cl. 148-12.00B.

Fujimura, Osamu, to Bell Telephone Laboratories, Incorporated. Speech transmission system. 4,170,719, Cl. 179-15.55R.

Fujitsu Fanuc Limited: *See*—
Hashimoto, Yoshihiro; Oyama, Shigeaki; and Araki, Hiroshi, 4,170,276, Cl. 192-48.910.

Fukatsu, Shunzo: *See*—
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,170,642, Cl. 424-180.000.

Fukinbara, Hazime: *See*—
Fujii, Sumihide; Fukinbara, Hazime; Mizutani, Katuzi; Nishibe, Minoru; and Ishii, Yoshitomo, 4,170,494, Cl. 148-12.00B.

Fullagar, David: *See*—
Taguchi, Tatsuya; Iura, Yukio; Takishima, Yoshiyuki; and Fullagar, David, 4,170,411, Cl. 354-24.000.

Furniss, Malcolm M.: *See*—
Young, James W.; and Furniss, Malcolm M., 4,170,631, Cl. 424-19.000.

G. D. Searle & Co.: *See*—
Mueller, Richard A., 4,170,593, Cl. 260-243.300.

G. D. Searle & Co., Ltd.: *See*—
Collins, Michael H., 4,170,231, Cl. 128-283.000.

Gambrell, Joseph L.: *See*—
Baumann, Gerald W.; Gambrell, Joseph L.; Hayes, George F.; Schell, Francis J.; and Schulte, Allen G., 4,170,349, Cl. 271-296.000.

Ganellin, Charon R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., 4,170,652, Cl. 424-263.000.

Garber, Michael B.: *See*—
Cox, John T.; Garber, Michael B.; Jasper, Marilyn A.; and Longshore, Randolph E., 4,170,781, Cl. 357-30.000.

Garcia, Fortunato C. Closure latch. 4,170,374, Cl. 292-201.000.

Gardner, William L. Planar helical flowmeter. 4,170,133, Cl. 73-194.0EM.

Garrett, Scott T.; Rudzena, William L.; and Jess, Thurman S., to Baxter Travenol Laboratories, Inc. Body fluid measuring device. 4,170,224, Cl. 128-748.000.

Garrison, Robert L.: *See*—
Morris, James C.; and Garrison, Robert L., 4,170,769, Cl. 340-384.00E.

Gartland, William R. Mold making machine. 4,170,258, Cl. 164-187.000.

Gates, David L.: *See*—
Van Tyne, Richard G.; Sanders, Weldon A., Jr.; De La Matyr, Richard D.; and Gates, David L., 4,170,419, Cl. 356-431.000.

Gause, Dieter: *See*—
Gunschmann, Peter; Rossmann, Heinrich; Wolf, Theo; and Gause, Dieter, 4,170,787, Cl. 360-95.000.

Gavin, Joseph G., to Grumman Corporation. Solar heat collector construction. 4,170,221, Cl. 126-446.000.

General Aviation Electronics, Inc.: *See*—
Shepperd, Michael E., 4,170,756, Cl. 325-21.000.

General Battery Corporation: *See*—
Nees, John M., 4,170,692, Cl. 429-48.000.

General Cable Corporation: *See*—
Brorein, William J.; and Tattanelli, Robert, 4,170,510, Cl. 156-432.000.

General Electric Company: *See*—
Anthony, Thomas R.; and Cline, Harvey E., 4,170,490, Cl. 148-1.500.
Anthony, Thomas R.; and Cline, Harvey E., 4,170,496, Cl. 148-33.000.
Bottger, Bernard J., 4,170,391, Cl. 312-214.000.
Cline, Harvey E.; Houston, Douglas E.; and Anthony, Thomas R., 4,170,491, Cl. 148-1.500.
Conlon, Bartholomew F., Jr., 4,170,175, Cl. 101-1.000.
Conway, Gerard V., 4,170,394, Cl. 339-111.000.
Davenport, John M., 4,170,746, Cl. 315-246.000.
Dawson, Charles, 4,170,624, Cl. 264-564.000.
Fridrich, Elmer G., 4,170,619, Cl. 264-113.000.
Hansler, Richard L., 4,170,744, Cl. 315-90.000.
Orlando, Charles M.; and Lavallee, Francois A., 4,170,711, Cl. 568-610.000.
Rothenberg, Sidney; and Vostovich, Joseph E., 4,170,575, Cl. 252-511.000.
Zgraggen, Martin A., 4,170,505, Cl. 156-162.000.

General Mills, Inc.: *See*—
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,170,632, Cl. 424-48.000.
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,170,633, Cl. 424-48.000.

General Motors Corporation: *See*—
Stricker, Ira J., 4,170,751, Cl. 318-563.000.

General Signal Corporation: *See*—
Beck, Harold L.; Wuebker, Robert A.; and Aure, Louis J., deceased, 4,170,373, Cl. 280-666.000.

General X-Ray Corporation: *See—*
Codina, Jorge G.; Estelle, Weems E.; and Stussman, Gerald J., 4,170,735, Cl. 250-422.000.

Generini, Gianni, to Anic S.p.A. Method for coalescing mercury particles. 4,170,552, Cl. 210-42.00S.

Gentex Corporation: *See—*
Aileo, Jackson A., 4,170,042, Cl. 2-424.000.

Gentry, Richard W. Parts cleaning machine. 4,170,240, Cl. 134-57.00R.

Georgia Marble Company, The: *See—*
Skinner, David L.; and Moon, Edward L., 4,170,658, Cl. 423-430.000.

Gerber, Eliot S.: *See—*
Bach, Bert; and Gerber, Eliot S., 4,170,400, Cl. 350-96.250.

Gerber Scientific Instrument Company, The: *See—*
Rich, Leonard G.; and Berdat, Henry F., 4,170,745, Cl. 315-241.00R.

Gerken, John M., to TRW Inc. Method of making and using a welding chill. 4,170,473, Cl. 75-208.00R.

Gero, Stephan; Mercier, Daniel; Olesker, Alain; and Cier, Andre, to Labaz. Aminoglycoside-aminocyclitol derivatives and method of use. 4,170,643, Cl. 424-181.000.

GES Gesellschaft fur Elektrischen Strassenverkehr mbH: *See—*
Busch, Heinrich; and Zander, Eberhard, 4,170,752, Cl. 320-44.000.

Gestetner Limited: *See—*
Spicer, Leonard A.; McGee, Derek J.; and Elson, Ian H., 4,170,687, Cl. 428-421.000.

Gibson, John C., to Gibson Motor and Machine Service, Inc. Pump and roll, vehicle with an elevatable water tower. 4,170,264, Cl. 169-24.000.

Gibson Motor and Machine Service, Inc.: *See—*
Gibson, John C., 4,170,264, Cl. 169-24.000.

Giglia, Robert D.; and Clasen, Richard H., to American Cyanamid Company. Electrochromic devices having protective interlayers. 4,170,406, Cl. 350-357.000.

Gill, Arthur W.; and Loup, Ronald L., to Double A Products Company. Hydraulic valve module. 4,170,214, Cl. 137-269.000.

Gillett, Kenneth: *See—*
Daughton, John W.; Gillett, Kenneth; Nelson, Frank; and Wilczek, Stephen P., 4,170,791, Cl. 364-900.000.

Gilliland, Elbert G. Aqualock closet valve. 4,170,049, Cl. 4-427.000.

Ginger, Edward A., to UOP Inc. Process for the simultaneous separation of sulfur and nitrogen oxides from a gaseous mixture. 4,170,627, Cl. 423-239.000.

Girault, Pierre: *See—*
Perronnet, Jacques; and Girault, Pierre, 4,170,465, Cl. 71-118.000.

Givaudan Corporation: *See—*
Brandman, Harold A.; Freudewald, Joachim E.; Manowitz, Milton; Nikawitz, Edward J.; and Sharpell, Frederick H., Jr., 4,170,704, Cl. 546-290.000.
Dubs, Paul; and Kuntzel, Heiner, 4,170,594, Cl. 548-229.000.

Glasgow, Robert L. Table skirting and double-grip clip. 4,170,181, Cl. 108-50.000.

Gleason Works, The: *See—*
Ellwanger, Charles G.; and Pedersen, Harry, 4,170,091, Cl. 51-5.00D.

Globe-Union Inc.: *See—*
Marshall, Dennis L.; and Matuszewski, Anthony, 4,170,470, Cl. 75-166.00D.

Gniewek, Stephen A.; and Olsen, Dick M., to Clayton Mfg. Co. Single sensor engine analyzer with noise rejection and automatic triggering circuit. 4,170,131, Cl. 73-116.000.

Goeke, George L.; Hamer, Anthony D.; and Karol, Frederick J., to Union Carbide Corporation. Catalytic polymerization of ethylene with supported chromium [II] catalyst in the presence of a phenolic antioxidant. 4,170,589, Cl. 260-45.95H.

Goldstein, H. Lawrence; and Shaw, Henry, to Exxon Research & Engineering Co. Method of separating solid particulate. 4,170,447, Cl. 423-215.500.

Gooch, Beverley R., to Ampex Corporation. Method of manufacturing a magnetic transducer for narrow track recording and playback. 4,170,059, Cl. 29-603.000.

Goodyear Tire & Rubber Company, The: *See—*
Buchanan, Jack W.; and Lindner, Daniel J., 4,170,503, Cl. 156-116.000.
Kubinski, Donald C., 4,170,509, Cl. 156-405.00R.
Riggs, Robert S., 4,170,504, Cl. 156-123.00R.

Gordon, Gerald A.: *See—*
Weierman, Robert J.; Merle, Joseph J.; Gordon, Gerald A.; Pan, Peter N. Y.; and Hernandez, Rafael J., 4,170,314, Cl. 220-260.000.

Gordon, Philip D. Semi-automatic milk flow sensor. 4,170,198, Cl. 119-14.080.

Gould Inc.: *See—*
Kirman, Lyle E.; and Kruper, Wayne A., 4,170,525, Cl. 204-23.000.

Grace, Archie R.; and Grace, Robert J. Microfilm adaption unit for photocopier machines. 4,170,412, Cl. 355-5.000.

Grace, Robert J.: *See—*
Grace, Archie R.; and Grace, Robert J., 4,170,412, Cl. 355-5.000.

Graham Magnetics, Inc.: *See—*
Deffeyes, Robert J.; and Tyler, Wesley R., 4,170,602, Cl. 260-439.00R.

Graham, Raymond, to Dytek Corporation. System for use with electrosurgical pencil. 4,170,234, Cl. 128-303.140.

Grane, Gunnar, to Dynapac Maskin Aktiebolag. Vibrating tamper. 4,170,427, Cl. 404-133.000.

Green, John C.: *See—*
Kalert, Ralph E.; and Green, John C., 4,170,615, Cl. 261-23.00A.

Greenberg, Charles B.: *See—*
Breininger, J. Shannon; and Greenberg, Charles B., 4,170,461, Cl. 65-60.00D.

Greengrass, Michael, to Flexipane Limited. Reinforced flexible panels comprising plastic sheeting on opposed sides of a mesh layer and a metal foil layer in association with a plastic sheet layer. 4,170,675, Cl. 428-109.000.

Greer, George C. Golf club. 4,170,357, Cl. 273-167.00R.

Greif Bros. Corporation: *See—*
Dubois, Robert A.; and Smith, George F., 4,170,623, Cl. 264-534.000.

Greiner, Henri; and LeFaucheur, Claude, to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes. Pneumatic tires. 4,170,255, Cl. 152-361.0FP.

Griffin, Howard E., to Dow Corning Corporation. Method and composition relating to emulsion-polymerized polydimethylsiloxanes in durable press resins. 4,170,581, Cl. 260-29.40R.

Grigg, Geoffrey W.; and Sasse, Wolfgang H. F., to Commonwealth Scientific and Industrial Research Organization. Antibiotic mixtures. 4,170,640, Cl. 424-177.000.

Grollier, Jean-Francois; Monnais, Christian; and Fourcadier, Chantal, to L'Oreal. Dye composition containing diphenylamine and polyhydroxybenzene. 4,170,452, Cl. 8-10.200.

Groov-Pin Corporation: *See—*
Bosse, Robert W., 4,170,050, Cl. 10-10.00R.

Gross, Jerome A.: *See—*
Strutman, Warren A., 4,170,369, Cl. 280-261.000.

Grover, Martin M.: *See—*
Pastor, Stephen D.; and Grover, Martin M., 4,170,612, Cl. 525-101.000.

Grumman Corporation: *See—*
Gavin, Joseph G., 4,170,221, Cl. 126-446.000.

GST-Regeltechnik GmbH: *See—*
Lang, Helmut; Overath, Horst; and Priester, Heinz-Werner, 4,170,553, Cl. 210-49.000.

GTE Automatic Electric Laboratories, Incorporated: *See—*
Blackburn, Tom L., 4,170,722, Cl. 179-175.30R.
Wright, Stanley J., 4,170,326, Cl. 228-37.000.

GTE Sylvania Incorporated: *See—*
Baker, Scott H.; and Manners, David E., 4,170,784, Cl. 358-190.000.
Morris, James C.; and Garrison, Robert L., 4,170,769, Cl. 340-384.00E.
Radecki, Dan J.; and Chadwick, Curt H., 4,170,763, Cl. 331-94.50D.

Gude, Armin: *See—*
Hegenberg, Peter, deceased; Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helmut; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, 4,170,588, Cl. 260-45.80N.

Guendulain, Ramon P. Multiple modular switch and wall plug. 4,170,730, Cl. 200-67.00F.

Gulf Oil Corporation: *See—*
Clampitt, Bert H.; and Horstman, Donald E., 4,170,586, Cl. 260-33.6PQ.

Gulf Research and Development Company: *See—*
Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., 4,170,545, Cl. 208-210.000.
Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., 4,170,546, Cl. 208-210.000.
Williamson, Roger C.; and Kobylinski, Thaddeus P., 4,170,605, Cl. 260-449.00L.
Williamson, Roger C.; and Kobylinski, Thaddeus P., 4,170,606, Cl. 260-449.00L.

Gunschmann, Peter; Rossmann, Heinrich; Wolf, Theo; and Gause, Dieter, to Robert Bosch GmbH. Tape recording/reproducing apparatus, particularly for operation with video tape cassettes. 4,170,787, Cl. 360-95.000.

Guo, Jong. Electronic musical instrument. 4,170,160, Cl. 84-1.010.

Gupta, Amitava: *See—*
Rembaum, Alan; Gupta, Amitava; and Volksen, Willi, 4,170,685, Cl. 428-402.000.

Gupta, Viney K.: *See—*
Chase, Gordon G.; Harlow, Richard A.; and Gupta, Viney K., 4,170,694, Cl. 429-176.000.

Gusmer Corporation: *See—*
Gusmer, Frederick E.; Commette, Denis S.; and Bairunas, Robert A., 4,170,440, Cl. 417-426.000.

Gusmer, Frederick E.; Commette, Denis S.; and Bairunas, Robert A., to Gusmer Corporation. Feeder for apparatus for ejecting urethane foam formed by the mixture of resin and isocyanate with flushing liquid. 4,170,440, Cl. 417-426.000.

Gustafson, Richard H.; and Kemp, Gordon A., to American Cyanamid Company. Method for the control of *Bordetella bronchiseptica* in swine with antibiotic BM123y. 4,170,644, Cl. 424-181.000.

Gustafson, Richard H.; and Kemp, Gordon A., to American Cyanamid Company. Antibacterial agent BM123y, salts and alkyl derivatives thereof for the control of shipping fever in cattle. 4,170,645, Cl. 424-181.000.

Gustafson, Richard H.; and Kemp, Gordon A., to American Cyanamid Company. Method for the control of *Mycoplasma hyopneumoniae* in swine with alkylated BM123y type antibiotics. 4,170,646, Cl. 424-181.000.

Gustafson, Richard H.; and Kemp, Gordon A., to American Cyanamid Company. Method for the control of *Arizona hinshawii* in poultry with an alkylated BM123y-type antibiotic. 4,170,647, Cl. 424-181.000.
Haahjem, Kaare, to Haahjem Mekanishe A/A. Apparatus for emptying bulk material from a storage chamber. 4,170,433, Cl. 414-313.000.
Haahjem Mekanishe A/A: *See*—
Haahjem, Kaare, 4,170,433, Cl. 414-313.000.
Haaland, Per, to A/S Den Norske Remfabrik. Gasket of rubber or a similar material. 4,170,365, Cl. 277-207.00A.
Haffer, Gregor: *See*—
Weber, Alfred; Kennecke, Mario; Popper, Alfred; Muller, Rudolf; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Neef, Gunter; and Wiechert, Rudolf, 4,170,518, Cl. 435-55.000.
Hagenlocher, Arno K.: *See*—
Kuehnle, Manfred R.; and Hagenlocher, Arno K., 4,170,475, Cl. 96-1.00C.
Hahn, Ernest A.; Murphy, Gary F., deceased (by Murphy, Mary Lou, administratrix); and Bruckbauer, Gerald J., to PPG Industries, Inc. Method for producing coatings of low gloss. 4,170,663, Cl. 427-44.000.
Haley, Frank P., to FMC Corporation. Digital control valve. 4,170,245, Cl. 137-487.500.
Hall, John B.; Wiegers, Wilhelmus J.; Hill, Ira D.; Novak, Robert M.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Uses of mixtures of alpha methyl styrene dimers and terpene dimers in perfumery processes and products. 4,170,576, Cl. 252-522.000.
Hamer, Anthony D.: *See*—
Goeke, George L.; Hamer, Anthony D.; and Karol, Frederick J., 4,170,589, Cl. 260-45.95H.
Hancock, Herbert C. Playing cards. 4,170,358, Cl. 273-304.000.
Haneklaus, Karl-Heinz: *See*—
Doerffel, Joerg; and Haneklaus, Karl-Heinz, 4,170,580, Cl. 260-29.40R.
Hanifin, John W., Jr.; and Ridge, David N., to American Cyanamid Company. Compositions containing cis-2-benzoyl-3-hydroxy-crotononitrile used to treat inflammation and joint deterioration. 4,170,656, Cl. 424-304.000.
Hanloser, Kurt J.: *See*—
Egan, William J., Jr.; Hanloser, Kurt J.; and Shadowen, James H., 4,170,109, Cl. 60-204.000.
Hansch, Ferdinand: *See*—
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, 4,170,684, Cl. 428-379.000.
Hansen, Glen D.: *See*—
Buschbom, Floyd E.; Hansen, Glen D.; and Paulson, Jerome T., 4,170,385, Cl. 406-59.000.
Hansen, Niels J.; and Hintze, William, to AMP Incorporated. LED fiber optic connector. 4,170,399, Cl. 350-96.200.
Hansen, William A.; and Conly, William A. Fireplace. 4,170,219, Cl. 126-121.000.
Hansler, Richard L., to General Electric Company. Combination discharge-incandescent lamp with thermal switch control. 4,170,744, Cl. 315-90.000.
Hara, Hiroshi: *See*—
Narita, Kiichi; Hara, Hiroshi; Taniguchi, Masayuki; Yamaguchi, Masaru; and Matumoto, Iwao, 4,170,139, Cl. 73-425.600.
Harlow, Richard A.: *See*—
Chase, Gordon G.; Harlow, Richard A.; and Gupta, Viney K., 4,170,694, Cl. 429-176.000.
Harper, Robert J., Jr.; Calamari, Timothy A., Jr.; and Schreiber, Sidney P., to United States of America, Agriculture. Formulations for imparting flame retardance to cellulosic fabrics via transfer techniques. 4,170,670, Cl. 427-341.000.
Harris Corporation: *See*—
Mebus, Henry R., 4,170,288, Cl. 198-440.000.
Murray, Robert R.; and Jackson, Dale H., 4,170,346, Cl. 270-54.000.
Hartley, Ronald C. Fireplace heaters. 4,170,218, Cl. 126-121.000.
Hartmann & Braun Aktiengesellschaft: *See*—
Weiss, Harald, 4,170,733, Cl. 250-374.000.
Hartwick, George J. Smoke eliminator method and apparatus. 4,170,458, Cl. 55-85.000.
Hase, Masahiro. Twin air pump. 4,170,439, Cl. 417-413.000.
Hasegawa, Seiji: *See*—
Hirai, Yutaka; Miyata, Katsuharu; and Hasegawa, Seiji, 4,170,708, Cl. 560-24.000.
Hashimoto, Komei; Komatsubara, Masahiro; Yasuda, Shinji; Masumoto, Yutaka; and Satoh, Kazuhiko, to Pioneer Electronic Corporation. Magnetic head. 4,170,788, Cl. 360-129.000.
Hashimoto, Yoshihiro; Oyama, Shigeaki; and Araki, Hiroshi, to Fujitsu Fanuc Limited. Motor with selectable speed clutch. 4,170,276, Cl. 192-48.910.
Hayes, George F.: *See*—
Baumann, Gerald W.; Gambrell, Joseph L.; Hayes, George F.; Schell, Francis J.; and Schulte, Allen G., 4,170,349, Cl. 271-296.000.
Heckles, John S., to Armstrong Cork Company. Smoke-suppressant composition. 4,170,584, Cl. 260-30.40R.
Heckman, Russell W.; and Nickey, George A., to Owens-Illinois, Inc. Powder dryer including fluidized bed aspirator. 4,170,074, Cl. 34-57.00A.
Hegenberg, Anna F.: *See*—
Hegenberg, Peter, deceased; Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helmut; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, 4,170,588, Cl. 260-45.80N.
Hegenberg, Dagmar, heir: *See*—
Hegenberg, Peter, deceased; Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helmut; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, 4,170,588, Cl. 260-45.80N.
Hegenberg, Joachim, heir: *See*—
Hegenberg, Peter, deceased; Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helmut; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, 4,170,588, Cl. 260-45.80N.
Hegenberg, Johanna M., heir: *See*—
Hegenberg, Peter, deceased; Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helmut; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, 4,170,588, Cl. 260-45.80N.
Hegenberg, Peter, deceased (by Hegenberg, Anna F.); Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helmut; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, to Chemische Werke Huls Aktiengesellschaft. Synthetic resin stabilizers based on quadratic acid amides. 4,170,588, Cl. 260-45.80N.
Heijke, Hermanus N.: *See*—
Floet, Wilhelmus F. W.; and Heijke, Hermanus N., 4,170,097, Cl. 53-567.000.
Heinrich, Theodore M.: *See*—
Schmitz, Johannes J.; and Heinrich, Theodore M., 4,170,754, Cl. 324-208.000.
Helm, Frederick A. Automobile top luggage rack. 4,170,323, Cl. 224-309.000.
Helm, Frederick A. Universal mount wind deflector and method of mounting. 4,170,381, Cl. 296-91.000.
Helm, Herbert; Kundinger, Kurt; and Schanz, Karl-Heinz, to Rohm GmbH. Closure for double-walled webbed structures. 4,170,094, Cl. 52-821.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Zeidler, Ulrich; and Scheuermann, Fanny, 4,170,655, Cl. 424-284.000.
Henrie, James O., to Rockwell International Corporation. Gas monitoring method and apparatus therefor. 4,170,455, Cl. 23-232.00R.
Henry, Daniel E. Locking mechanism for folding pocket knife. 4,170,061, Cl. 30-160.000.
Herman, John. Cigarette holder. 4,170,239, Cl. 131-257.000.
Hernandez, Rafael J.: *See*—
Weierman, Robert J.; Merle, Joseph J.; Gordon, Gerald A.; Pan, Peter N. Y.; and Hernandez, Rafael J., 4,170,314, Cl. 220-260.000.
Herr, Roy W.: *See*—
Creutz, Hans G., deceased; and Herr, Roy W., 4,170,526, Cl. 204-55.00R.
Herrington, Daniel R.; and Schwerko, Albert P., to Standard Oil Company. Amphora aggregates and the process for their preparation. 4,170,569, Cl. 252-448.000.
Herrington, F. John, Jr., to Mobil Oil Corporation. Flow distribution valve system for control of extrusion from multiple die orifices. 4,170,450, Cl. 425-464.000.
Hertzberg, Abraham; and Russell, David A., to Mathematical Sciences Northwest, Inc. Weapons system. 4,170,330, Cl. 244-3.130.
Hesston Corporation: *See*—
White, Bruce L.; Arter, Edward S.; and Kiner, Mark W., 4,170,426, Cl. 414-111.000.
Hewlett-Packard Company: *See*—
Craven, John S., 4,170,126, Cl. 73-27.00A.
Hightower, James R., to S.W.F. Machinery, Inc. Apparatus for handling containers and the like of varying dimensions. 4,170,095, Cl. 53-75.000.
Hilbert, Francis H.; and Parker, Norman W., to Motorola, Inc. AM stereo receiver with correction limiting. 4,170,716, Cl. 179-1.0GS.
Hildebrand, B. Percy: *See*—
Posakony, Gerald J.; Hildebrand, B. Percy; and Davis, Thomas J., 4,170,142, Cl. 73-603.000.
Hill, Ira D.: *See*—
Hall, John B.; Wiegers, Wilhelmus J.; Hill, Ira D.; Novak, Robert M.; and Schmitt, Frederick L., 4,170,576, Cl. 252-522.000.
Hills, Isaac. Stuffed toy animal. 4,170,086, Cl. 46-158.000.
Himmetsberger, Alois: *See*—
Weigl, Erwin; and Himmetsberger, Alois, 4,170,371, Cl. 280-625.000.
Hinchcliffe, Dennis, to Molins, Ltd. Apparatus for handling rod-like articles. 4,170,285, Cl. 198-347.000.
Hine, Edwin W., II, to Proctor & Schwartz, Inc. Method and apparatus for determining the weight and moisture content of materials. 4,170,251, Cl. 141-11.000.
Hinterkopf, Kurt G.: *See*—
Domeniconi, Marcel, 4,170,176, Cl. 101-330.000.
Hintze, William: *See*—
Hansen, Niels J.; and Hintze, William, 4,170,399, Cl. 350-96.200.
Hirai, Yutaka; Miyata, Katsuharu; and Hasegawa, Seiji, to Mitsui Toatsu Chemicals, Incorporated. Process for preparing aromatic urethanes. 4,170,708, Cl. 560-24.000.
Hirasawa, Youji; and Yamamoto, Hisataka, to Nippon Paint Co., Ltd. Method for treatment of metal surface. 4,170,671, Cl. 427-388.00C.

Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, to Sumitomo Chemical Company, Limited. Enzyme-immobilization carrier and preparation thereof. 4,170,696, Cl. 521-29.000.
Hirsch, Richard H., to Monsanto Company. Process for polymerizing a thiobisphenol. 4,170,702, Cl. 528-219.000.
Hiscott, Donald W. Marine azimuth and intercept plotter instrument. 4,170,065, Cl. 33-431.000.
Hitachi, Ltd.: *See*—
Aiuchi, Susumu; Ikeda, Minoru; and Matsumoto, Yoshio, 4,170,418, Cl. 356-400.000.
Mizokawa, Sadao, 4,170,715, Cl. 178-68.000.
Shinbo, Katsutoshi; and Hosokawa, Takanori, 4,170,516, Cl. 176-20.00R.
Sugimoto, Norihiko, 4,170,786, Cl. 360-40.000.
Hitachi Shipbuilding & Engineering Co., Ltd.: *See*—
Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, 4,170,574, Cl. 252-472.000.
Hoechst Aktiengesellschaft: *See*—
Schon, Klaus-Peter, 4,170,195, Cl. 118-658.000.
Wortmann, Joachim; Schonrogge, Burkhard; Cremer, Joseph; and Dany, Franz-Josef, 4,170,508, Cl. 156-308.000.
Hoeink, Helmut; Jaeger, Waldemar; Scholich, Peter; Roeschlein, Rolf; and Podtschaske, Helmut, to Nixdorf Computer AG. Transport device for reading of identification cards. 4,170,348, Cl. 271-240.000.
Hoelscher, Harold E., to American Cyanamid Company. Method for producing particulate solids in a turbulent wake burner. 4,170,630, Cl. 423-409.000.
Hoffmann-La Roche Inc.: *See*—
Westley, John; and Liu, Chao-Min, 4,170,595, Cl. 260-325.00R.
Holekamp, Malcolm L. Dredge with rotatable cutter discs. 4,170,079, Cl. 37-65.000.
Holmes, Kenneth P., to Esquire, Inc. Fixed frequency, variable duty cycle, square wave dimmer for high intensity gaseous discharge lamp. 4,170,747, Cl. 315-307.000.
Holst, Jan-Olov M.: *See*—
Blomberg, Folke I.; and Holst, Jan-Olov M., 4,170,066, Cl. 303-114.000.
Honda, Iwao: *See*—
Moriya, Koichi; and Honda, Iwao, 4,170,672, Cl. 427-391.000.
Honeywell Inc.: *See*—
Caron, Patrick; and Manier, Francis, 4,170,780, Cl. 346-141.000.
Honour, David, to British Petroleum Company Limited, The. Waste oil recovery unit. 4,170,551, Cl. 210-27.000.
Hood, Clarence E., Jr.; Alper, Yekutiel; and Webb, Byron K., to Clemson University. Tree shaker. 4,170,100, Cl. 56-328.0TS.
Hooker Chemicals & Plastics Corp.: *See*—
Lazarz, Christine A.; Cook, Edward H., Jr.; and Scripa, Lesleigh V., 4,170,540, Cl. 204-296.000.
Hoppes, William F.: *See*—
Hull, Raymond J., Jr.; and Hoppes, William F., 4,170,305, Cl. 206-606.000.
Horie, Kouji: *See*—
Takeuchi, Yukihisa; and Horie, Kouji, 4,170,200, Cl. 123-3.000.
Horiki, Akira: *See*—
Miyazaki, Katsuyuki; and Horiki, Akira, 4,170,718, Cl. 179-15.0BY.
Horiuchi, Yukio: *See*—
Akita, Eiichi; Horiuchi, Yukio; Miyazawa, Takeo; and Umezawa, Hamao, 4,170,641, Cl. 424-180.000.
Horler, Hansulrich, to BBC Brown, Boveri & Company Limited. Method and apparatus for intercooling the charge air of a pressure-charged internal combustion engine. 4,170,107, Cl. 60-39.450.
Horstman, Donald E.: *See*—
Clampitt, Bert H.; and Horstman, Donald E., 4,170,586, Cl. 260-33.6PQ.
Hosokawa, Takanori: *See*—
Shinbo, Katsutoshi; and Hosokawa, Takanori, 4,170,516, Cl. 176-20.00R.
Houston, Douglas E.: *See*—
Cline, Harvey E.; Houston, Douglas E.; and Anthony, Thomas R., 4,170,491, Cl. 148-1.500.
Houston, Stanley M. Pedestal wear liner assembly. 4,170,180, Cl. 105-225.000.
Howell, Melvyn J.; and Pilch, Raymond C., to Miller Fluid Power Corporation. Fiber optic control modules and system employing the same. 4,170,731, Cl. 250-227.000.
Hubelbank, Mark: *See*—
Feldman, Charles L.; and Hubelbank, Mark, 4,170,227, Cl. 128-704.000.
Hubert, Wallace L.; and Underhill, Thomas T., to International Business Machines Corporation. Document feed controls for copy production machines. 4,170,414, Cl. 355-14.000.
Hueschens, Rolf: *See*—
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Budden, Renke; and Bahlsen, Jacqueline, 4,170,649, Cl. 424-244.000.
Huke, Peter N., to British Cellophane Limited. Wrapping film. 4,170,304, Cl. 206-597.000.
Hull, Raymond J., Jr.; and Hoppes, William F., to Johnson & Johnson. Easy-open wrapper for cylindrical products. 4,170,305, Cl. 206-606.000.
Hunsicker, Larry R.: *See*—
Olson, Daniel H.; Hunsicker, Larry R.; and Johnson, Stanley A., 4,170,151, Cl. 74-501.00R.
Hurst, Robert L.: *See*—
Scholes, Addison B.; Dollar, David L.; and Hurst, Robert L., 4,170,193, Cl. 118-627.000.
Hutcheson, Edward T., to United States of America, Army. Anisotropic resistance bonding technique. 4,170,677, Cl. 428-119.000.
Ichinose, Noboru; Ohkuma, Hideo; Takahashi, Takashi; and Takei, Masayoshi, to Tokyo Shibaura Electric Co., Ltd.; and Takei, Masayoshi. Gas leak-detecting apparatus. 4,170,770, Cl. 340-634.000.
Idler, Gustav, to C. Eugen Maier Metallverarbeitung GmbH, Firma. Article orienting device. 4,170,283, Cl. 193-45.000.
Igashira, Toshihiko: *See*—
Mori, Kouichi; Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; and Morino, Seiji, 4,170,212, €l. 123-211.000.
Ignatowicz, Steven A., to Kay-Ray, Inc. Wide dynamic range multizone drying method and apparatus for controlling product moisture. 4,170,073, Cl. 34-31.000.
Iida, Mitsuhiko; Kato, Yasuo; Baba, Kazuyuki; and Fujie, Hideo, to Toshiba Kikai Kabushiki Kaisha. Printing machine inking device with plurality of cam levers. 4,170,177, Cl. 101-365.000.
Ikeda, Minoru: *See*—
Aiuchi, Susumu; Ikeda, Minoru; and Matsumoto, Yoshio, 4,170,418, Cl. 356-400.000.
Ikenoue, Shinpei; Masuda, Takao; Katsuyama, Harumi; Sekikawa, Nobuyoshi; Shishido, Tadao; and Sakai, Nobuo, to Fuji Photo Film Co., Ltd. Thermally developable light-sensitive material. 4,170,480, Cl. 96-114.100.
Ikrath, Gertrude, executrix: *See*—
Skudera, William J.; De Santis, Charles M.; and Ikrath, Kurt, deceased, 4,170,757, Cl. 325-32.000.
Ikrath, Kurt, deceased: *See*—
Skudera, William J.; De Santis, Charles M.; and Ikrath, Kurt, deceased, 4,170,757, Cl. 325-32.000.
Imai, Hirosuke: *See*—
Itoh, Hiroyuki; Yamanashi, Teruaki; and Imai, Hirosuke, 4,170,583, Cl. 260-29.70H.
Imperial Chemical Industries Limited: *See*—
Cumbers, David C., 4,170,680, Cl. 428-195.000.
Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, to Hitachi Shipbuilding & Engineering Co., Ltd. Process for producing oxidizing metal catalysts incorporating platinum and catalyst produced by the process. 4,170,574, Cl. 252-472.000.
Inazumi, Chikashi: *See*—
Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, 4,170,574, Cl. 252-472.000.
Ingram, Charles E., to Four Star Corporation. Velocity responsive deflector blade and pivotal mounting therefor. 4,170,377, Cl. 296-1.00S.
Inland Container Corporation: *See*—
Jones, Ancil A.; and Schmidt, Dwight C., 4,170,301, Cl. 206-423.000.
Inoue, Satoshi, to Matsushita Electric Industrial Co., Ltd. Magnetic tape recording and reproduction apparatus. 4,170,789, Cl. 360-137.000.
International Business Machines Corporation: *See*—
Bahr, Dietrich J.; Burckardt, Karl H.; and Spruth, Wilhelm G., 4,170,779, Cl. 346-139.00C.
Baumann, Gerald W.; Gambrell, Joseph L.; Hayes, George F.; Schell, Francis J.; and Schulte, Allen G., 4,170,349, Cl. 271-296.000.
Hubert, Wallace L.; and Underhill, Thomas T., 4,170,414, Cl. 355-14.000.
International Flavors & Fragrances Inc.: *See*—
Hall, John B.; Wiegers, Wilhelmus J.; Hill, Ira D.; Novak, Robert M.; and Schmitt, Frederick L., 4,170,576, Cl. 252-522.000.
Kamath, Venkatesh; Mookherjee, Braja D.; and Schmitt, Frederick L., 4,170,577, Cl. 252-522.000.
Withycombe, Donald A.; Mookherjee, Braja D.; Vock, Manfred H.; and Vinals, Joaquin F., 4,170,236, Cl. 131-2.000.
International Glass Equipment Co. S.A.R.L.: *See*—
Tourres, Francois G., 4,170,417, Cl. 356-385.000.
International Telephone and Telegraph Corporation: *See*—
Pernyeszi, Joseph, 4,170,740, Cl. 307-251.000.
Intimate Jewels, Inc.: *See*—
Block, Alvin, 4,170,118, Cl. 63-12.000.
Irwin, John F.: *See*—
Liu, Daniel T. H.; Irwin, John F.; and Pai, Rong-Chang, 4,170,639, Cl. 424-101.000.
Ishibashi, Hisanori; and Tajima, Tsuneso, to Sony Corporation. Microphone with molded block amplifier electrostatic. 4,170,721, Cl. 179-111.00R.
Ishigaki, Yoshio: *See*—
Yoshida, Susumu; Ishigaki, Yoshio; Shinkai, Kinya; and Tsuchiya, Takao, 4,170,785, Cl. 358-242.000.
Ishii, Yoshitomo: *See*—
Fujii, Sumihide; Fukinbara, Hazime; Mizutani, Katuzi; Nishibe, Minoru; and Ishii, Yoshitomo, 4,170,494, Cl. 148-12.00B.
Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, to Pioneer Electronic Corporation; and Tokorozawa Electronic Corporation. Piezoelectric transducer with multiple electrode areas. 4,170,742, Cl. 310-324.000.
Ito, Mitsuo. Pipe joint. 4,170,375, Cl. 285-348.000.
Itoh, Hiroyuki; Yamanashi, Teruaki; and Imai, Hirosuke, to Nippon Oil Company Limited. Phase-reversible composition. 4,170,583, Cl. 260-29.70H.
Iura, Yukio: *See*—
Taguchi, Tatsuya; Iura, Yukio; Takishima, Yoshiyuki; and Fullagar, David, 4,170,411, Cl. 354-24.000.

Ivanov, Evgeny G.: *See—*
Bobrov, Gennady N.; Shishkov, Mikhail I.; Kuzin, Gennady I.; Ivanov, Evgeny G.; and Akimov, Igor M., 4,170,737, Cl. 250-442.000.

Iwama, Kiyonori: *See—*
Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, 4,170,742, Cl. 310-324.000.

Iwaoka, Shoji: *See—*
Kaito, Hiroyuki; Ohtani, Takashi; Iwaoka, Shoji; Oguchi, Yukio; Yano, Shuya; and Ejima, Akio, 4,170,467, Cl. 75-49.000.

Izraeli, Hyman, to Thomas & Betts Corporation. Full stroke compelling mechanism. 4,170,154, Cl. 81-313.000.

J. Ray McDermott & Co., Inc.: *See—*
Shaw, Clarence W., 4,170,186, Cl. 114-264.000.

J. S. Mannor Machine Corporation: *See—*
Norman, Maurice, 4,170,488, Cl. 134-10.000.

Jackson, Dale H.: *See—*
Murray, Robert R.; and Jackson, Dale H., 4,170,346, Cl. 270-54.000.

Jackson, James D.: *See—*
Blazek, William S.; Piwonka, Thomas S.; Jackson, James D.; and Atanmo, Philip N., 4,170,256, Cl. 164-26.000.

Jackson, William L., to Dunlop Limited. Tire with a straight sidewall. 4,170,254, Cl. 152-353.00R.

Jacobsen, Gerald A. Combined wind deflector and window awning assembly for recreational trailers. 4,170,378, Cl. 296-1.00S.

Jacobson, Darwin J. Aircraft parcel-pickup mechanism. 4,170,341, Cl. 254-172.000.

Jaeger, Waldemar: *See—*
Hoeink, Helmut; Jaeger, Waldemar; Scholich, Peter; Roeschlein, Rolf; and Podtschaske, Helmut, 4,170,348, Cl. 271-240.000.

Jakobs, Willy: *See—*
Megerle, Friedrich; Kryczun, Alfred; and Jakobs, Willy, 4,170,344, Cl. 266-204.000.

Jamison, Joseph L., Jr. Aquatic device attachable to a two-wheeled vehicle. 4,170,188, Cl. 115-27.000.

Janik, Leon P., Jr., to Stanadyne, Inc. Air starter. 4,170,210, Cl. 123-179.00F.

Jannsen, Klaus-Uwe: *See—*
Ries, Karl; Kaiser, Dieter; Quaye, Mesa; Boms, Heinz-Jurgen; and Jannsen, Klaus-Uwe, 4,170,143, Cl. 73-609.000.

Japan Carlit Co., Ltd., The: *See—*
Moriya, Koichi; and Honda, Iwao, 4,170,672, Cl. 427-391.000.

Jasper, Marilyn A.: *See—*
Cox, John T.; Garber, Michael B.; Jasper, Marilyn A.; and Longshore, Randolph E., 4,170,781, Cl. 357-30.000.

Jaudt, Andreas. Bucket wheel sluice having mesh-engaged removal unit. 4,170,321, Cl. 222-220.000.

Javeri, Rupin J.: *See—*
Petrie, Adelore F.; and Javeri, Rupin J., 4,170,209, Cl. 123-148.00E.

Jebens, Robert W., to RCA Corporation. Method of fabrication of a Fresnel lens. 4,170,616, Cl. 264-1.000.

Jedlick, Frank J.: *See—*
Corsette, Douglas F.; and Jedlick, Frank J., 4,170,047, Cl. 4-293.000.

Jenkins, Kenneth E., to Parker-Hannifin Corporation. Loader/backhoe hydraulic system and control valve assembly therefor. 4,170,168, Cl. 91-522.000.

Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Mack, Michael E.; and Woodroffe, Jaime A., 4,170,762, Cl. 331-94.50D.

Jess, Thurman S.: *See—*
Garrett, Scott T.; Rudzena, William L.; and Jess, Thurman S., 4,170,224, Cl. 128-748.000.

Jim Walter Corporation: *See—*
Wood, Edward H., 4,170,090, Cl. 49-176.000.

Johns-Manville Corporation: *See—*
French, David W., 4,170,448, Cl. 425-393.000.

Johnson, Charles H., to Packaging Corporation of America. Shipping unit. 4,170,297, Cl. 206-326.000.

Johnson, Gary, to Sta-Rite Industries, Inc. Pilot operator valve. 4,170,246, Cl. 137-596.120.

Johnson & Johnson: *See—*
Hull, Raymond J., Jr.; and Hoppes, William F., 4,170,305, Cl. 206-606.000.
Lalancette, Jean-Marc; and Coupal, Bernard, 4,170,515, Cl. 162-92.000.

Johnson, Louis W. Vibrating screen apparatus. 4,170,549, Cl. 209-363.000.

Johnson, Roy A.; and Sih, John C., to Upjohn Company, The. 5-Hydroxy-PGI$_1$ morpholinylamides. 4,170,703, Cl. 542-426.000.

Johnson, Stanley A.: *See—*
Olson, Daniel H.; Hunsicker, Larry R.; and Johnson, Stanley A., 4,170,151, Cl. 74-501.00R.

Jones, Ancil A.; and Schmidt, Dwight C., to Inland Container Corporation. Potted plant shipper. 4,170,301, Cl. 206-423.000.

Jones-Hamilton Co.: *See—*
Mattison, Grant G., 4,170,046, Cl. 4-182.000.

Jordan, Laurence R.: *See—*
Bartlett, Keith G.; Jordan, Laurence R.; and Mundt, Randall S., 4,170,492, Cl. 148-1.500.

Jost, Ernest M.; Reenstra, Arthur L.; and Trenkler, George, to Texas Instruments Incorporated. Transducer. 4,170,498, Cl. 148-121.000.

Josten, Friedrich; Cherubim, Martin; and Striso, Rainer, to Deutsche Texaco Aktiengesellschaft. Process for preparing bonding agents for light-colored weatherproof wood materials. 4,170,611, Cl. 525-494.000.

Joyes, John F., to Lucas Industries Limited. Electric vehicle traction motor control. 4,170,750, Cl. 318-345.00C.

Juve, Robert J. Automatic coating and spin drying apparatus. 4,170,191, Cl. 118-705.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
Kitagawa, Hiroshi, 4,170,768, Cl. 340-365.00S.

Kaftan, William P. Tuning device for a stringed instrument. 4,170,161, Cl. 84-312.00R.

Kai Cutlery Center Co., Ltd.: *See—*
Machida, Naoyosi, 4,170,062, Cl. 30-162.000.

Kaiser, Bernd-Ulrich: *See—*
Danziger, Harry; Kaiser, Bernd-Ulrich; Rampart, Guido; and Schroter, Jurgen, 4,170,592, Cl. 260-239.30A.

Kaiser, Dieter: *See—*
Ries, Karl; Kaiser, Dieter; Quaye, Mesa; Boms, Heinz-Jurgen; and Jannsen, Klaus-Uwe, 4,170,143, Cl. 73-609.000.

Kaito, Hiroyuki; Ohtani, Takashi; Iwaoka, Shoji; Oguchi, Yukio; Yano, Shuya; and Ejima, Akio, to Kawasaki Steel Corporation. Method for producing high chromium steels having extremely low carbon and nitrogen contents. 4,170,467, Cl. 75-49.000.

Kalert, Ralph E.; and Green, John C., to ACF Industries, Inc. Carburetor with second choke break. 4,170,615, Cl. 261-23.00A.

Kali-Chemie Pharma GmbH: *See—*
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Budden, Renke; and Bahlsen, Jacqueline, 4,170,649, Cl. 424-244.000.

Kalis, George, Jr., to Scott & Fetzer Company Stahl Division, The. Paddle handle lock bolt. 4,170,119, Cl. 70-221.000.

Kamath, Venkatesh; Mookherjee, Braja D.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. 2,3-Dimethyl-5-(2,2,3-trimethyl-3-cyclopenten-1-yl)-2-pentanol perfume compositions. 4,170,577, Cl. 252-522.000.

Kamino, Yasumi: *See—*
Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, 4,170,574, Cl. 252-472.000.

Kamody, John F., to Koppers Company, Inc. Process for reducing aqueous effluents containing environmentally unacceptable compounds from a process for gasifying carbonaceous materials. 4,170,550, Cl. 210-23.00H.

Kao, Wenling; and Rees, Richard W., to American Home Products Corporation. 16-Keto PGE$_2$ methyl esters. 4,170,709, Cl. 560-121.000.

Kao, Wenling: *See—*
Strike, Donald P.; and Kao, Wenling, 4,170,710, Cl. 562-503.000.

Kapfhammer, Karl, to Bayerische Motoren Werke Aktiengesellschaft. Circuit arrangement for electrically driven motor vehicles. 4,170,748, Cl. 318-139.000.

Karol, Frederick J.: *See—*
Goeke, George L.; Hamer, Anthony D.; and Karol, Frederick J., 4,170,589, Cl. 260-45.95H.

Kashio, Toshio, to Casio Computer Co., Ltd. Electronic timepiece. 4,170,105, Cl. 58-23.00R.

Kato, Yasuo: *See—*
Iida, Mitsuhiko; Kato, Yasuo; Baba, Kazuyuki; and Fujie, Hideo, 4,170,177, Cl. 101-365.000.

Katsanevas, Michael. Wheel lug nut tool. 4,170,069, Cl. 33-199.00R.

Katsui, Akinori; and Egashira, Kazumichi, to Nippon Telegraph and Telephone Public Corporation. Magneto-optic thin film for memory devices. 4,170,689, Cl. 428-457.000.

Katsumata, Mitsuo; and Nanjyo, Hirotoshi, to Kokusan Denki Co., Ltd. Ignition system for an internal combustion engine. 4,170,206, Cl. 123-148.0CC.

Katsumata, Mitsuo; Kondo, Tetsuya; and Watanabe, Takeshi, to Kokusan Denki Co., Ltd. Ignition system for a multiple cylinder internal combustion engine. 4,170,208, Cl. 123-148.0CC.

Katsuyama, Harumi: *See—*
Ikenoue, Shinpei; Masuda, Takao; Katsuyama, Harumi; Sekikawa, Nobuyoshi; Shishido, Tadao; and Sakai, Nobuo, 4,170,480, Cl. 96-114.100.

Katz, Leonard R.: *See—*
Meuschke, Robert E.; Desmarchais, Walter E.; and Katz, Leonard R., 4,170,517, Cl. 176-87.000.

Kawabata, Minoru: *See—*
Kondo, Yukio; Kawabata, Minoru; and Suzuki, Mikio, 4,170,438, Cl. 417-223.000.

Kawai, Hisasi: *See—*
Mori, Kouichi; Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; and Morino, Seiji, 4,170,212, Cl. 123-211.000.

Kawasaki, Keiji; and Takeshita, Tetsuo, to Showa Denko K.K. Electrolytic cathode and method for its production. 4,170,536, Cl. 204-290.00R.

Kawasaki Steel Corporation: *See—*
Kaito, Hiroyuki; Ohtani, Takashi; Iwaoka, Shoji; Oguchi, Yukio; Yano, Shuya; and Ejima, Akio, 4,170,467, Cl. 75-49.000.

Kay-Ray, Inc.: *See—*
Ignatowicz, Steven A., 4,170,073, Cl. 34-31.000.

Keane, Gordon H., Jr., to Computer Management Services, Inc. Single-point blocking method of surfacing and edging spectacle lenses. 4,170,092, Cl. 51-284.00E.

Keeling, Michael C.; and Doss, Dwight E., to Motorola, Inc. Method for encapsulating a solar cell array. 4,170,507, Cl. 156-245.000.

Keller, Richard L.: *See—*
Totino, Rose W.; Behnke, James R.; Westover, Jack D.; and Keller, Richard L., 4,170,659, Cl. 426-95.000.

Kellwood Company: *See*—
Beetschen, Robert E.; Lynch, Basil P.; and Short, Allie A., 4,170,682, Cl. 428-267.000.

Kemp, Gordon A.: *See*—
Gustafson, Richard H.; and Kemp, Gordon A., 4,170,644, Cl. 424-181.000.
Gustafson, Richard H.; and Kemp, Gordon A., 4,170,645, Cl. 424-181.000.
Gustafson, Richard H.; and Kemp, Gordon A., 4,170,646, Cl. 424-181.000.
Gustafson, Richard H.; and Kemp, Gordon A., 4,170,647, Cl. 424-181.000.

Kennecke, Mario: *See*—
Weber, Alfred; Kennecke, Mario; Popper, Alfred; Muller, Rudolf; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Neef, Gunter; and Wiechert, Rudolf, 4,170,518, Cl. 435-55.000.

Kennedy, James C.; and Woodmansee, Wayne E., to Boeing Company, The. Mechanized scanning, display and recording ultrasonic weld inspection system. 4,170,145, Cl. 73-620.000.

Kerby, Lawrence L. Centrifugal liquid cleaner. 4,170,558, Cl. 210-232.000.

Kessler, Hansruedi: *See*—
Dubach, Werner F.; and Kessler, Hansruedi, 4,170,315, Cl. 220-281.000.

Kettlestrings, John S. Disk toy and launcher. 4,170,215, Cl. 124-16.000.

Khajezadeh, Heshmat, to RCA Corporation. Method of making a semiconductor integrated circuit device utilizing simultaneous outdiffusion and autodoping during epitaxial deposition. 4,170,501, Cl. 148-175.000.

Khoury, Alexis E.: *See*—
Albainy, Bolivar; and Khoury, Alexis E., 4,170,226, Cl. 128-667.000.

Khoury, Francis E. Tracheo-bronchial sampler device. 4,170,232, Cl. 128-351.000.

Kiefer, Gunther, to Adolf Illig Maschinenbau GmbH & Co. Thermoforming apparatus and method of motion control. 4,170,621, Cl. 264-322.000.

Kiejzik, Paul A. Novel microfilm jacket. 4,170,081, Cl. 40-159.000.

Killion, Mead C. AGC circuit particularly for a hearing aid. 4,170,720, Cl. 179-107.00R.

Kimura, Kaoru: *See*—
Motegi, Akira; and Kimura, Kaoru, 4,170,585, Cl. 260-33.20R.

Kimura, Kazuo: *See*—
Sekida, Minoru; and Kimura, Kazuo, 4,170,410, Cl. 354-23.00R.

Kinard, Richard D.: *See*—
Edwards, Donald W.; Kinard, Richard D.; Wirbisky, Theodore J.; and Angelucci, Richard J., 4,170,287, Cl. 198-657.000.

Kiner, Mark W.: *See*—
White, Bruce L.; Arter, Edward S.; and Kiner, Mark W., 4,170,426, Cl. 414-111.000.

King, Harold L., to Rodgers, William C. Infinitely adjustable support bracket. 4,170,335, Cl. 248-246.000.

Kingry, Gary W.: *See*—
Flesher, Daniel J.; and Kingry, Gary W., 4,170,565, Cl. 252-93.000.

Kirk, Clair F.: *See*—
Kirk, Samuel A.; and Kirk, Clair F., 4,170,328, Cl. 233-13.000.

Kirk, Samuel A.; and Kirk, Clair F. Desalination by the inverse function of the known (salting-out) effect within an improved centrifuge. 4,170,328, Cl. 233-13.000.

Kirkwood, Kenneth C., to BP Chemicals Limited. Polymerization catalyst. 4,170,568, Cl. 252-430.000.

Kirman, Lyle E.; and Kruper, Wayne A., to Gould Inc. Process for plating a composite structure. 4,170,525, Cl. 204-23.000.

Kitagawa, Hiroshi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Key code generator. 4,170,768, Cl. 340-365.00S.

Kitko, David J., to Procter & Gamble Company, The. Peroxyacid bleach composition. 4,170,453, Cl. 8-111.000.

Kittle, Carl E.; and Wittren, Richard A., to Deere & Company. Hydraulic system with unloading valve assembly. 4,170,113, Cl. 60-427.000.

Klar, Erhard, to SCM Corporation. Water atomized copper alloys. 4,170,466, Cl. 75-0.50C.

Klockner-Humbolt-Deutz AG: *See*—
Megerle, Friedrich; Kryczun, Alfred; and Jakobs, Willy, 4,170,344, Cl. 266-204.000.

Knight, Patricia M.; and Link, William J., to American Hospital Supply Corporation. Coated intraocular lens and surgical tool. 4,170,043, Cl. 3-13.000.

Knight, Patricia M.; and Link, William J., to American Hospital Supply Corporation. Method of treating intraocular lens and the like. 4,170,661, Cl. 427-2.000.

Knoche, Hubert: *See*—
Chapelet, Gilbert; Knoche, Hubert; and Marie, Gilbert, 4,170,561, Cl. 252-51.50A.

Kobe Steel, Ltd.: *See*—
Fujii, Sumihide; Fukinbara, Hazime; Mizutani, Katuzi; Nishibe, Minoru; and Ishii, Yoshitomo, 4,170,494, Cl. 148-12.00B.
Narita, Kiichi; Hara, Hiroshi; Taniguchi, Masayuki; Yamaguchi, Masaru; and Matumoto, Iwao, 4,170,139, Cl. 73-425.600.

Kobylinski, Thaddeus P.: *See*—
Williamson, Roger C.; and Kobylinski, Thaddeus P., 4,170,605, Cl. 260-449.00L.
Williamson, Roger C.; and Kobylinski, Thaddeus P., 4,170,606, Cl. 260-449.00L.

Kocher, Rolf: *See*—
Schutz, Gerhard; and Kocher, Rolf, 4,170,446, Cl. 425-199.000.

Kodama, Masayuki; Takano, Toshio; and Makishima, Sadao, to Fuji Jukogyo Kabushiki Kaisha. Transmission apparatus for four-wheel drive motor vehicle. 4,170,273, Cl. 180-233.000.

Koegel, Ralph A., to Bunker Ramo Corporation. Multi-speed transmission with improved shifting means. 4,170,149, Cl. 74-339.000.

Koehring Company: *See*—
Rogers, Richard E., 4,170,308, Cl. 212-39.0DB.

Koester, Charles J. Scanning microscopic apparatus with three synchronously rotating reflecting surfaces. 4,170,398, Cl. 350-6.800.

Kokoku Rubber Industry Company, Ltd.: *See*—
Nakajyo, Noriaki; and Uchiyama, Toshihiko, 4,170,524, Cl. 204-15.000.

Kokusan Denki Co., Ltd.: *See*—
Boyama, Kimihiro, 4,170,207, Cl. 123-148.0CC.
Katsumata, Mitsuo; and Nanjyo, Hirotoshi, 4,170,206, Cl. 123-148.0CC.
Katsumata, Mitsuo; Kondo, Tetsuya; and Watanabe, Takeshi, 4,170,208, Cl. 123-148.0CC.

Komatsubara, Masahiro: *See*—
Hashimoto, Komei; Komatsubara, Masahiro; Yasuda, Shinji; Masumoto, Yutaka; and Satoh, Kazuhiko, 4,170,788, Cl. 360-129.000.

Kommanditbolaget United Stirling (Sweden) AB & Co.: *See*—
Bergman, Ulf C., 4,170,363, Cl. 277-24.000.

Kondo, Kenshi. Lead wire cutter. 4,170,156, Cl. 83-418.000.

Kondo, Shinichi: *See*—
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,170,642, Cl. 424-180.000.

Kondo, Tetsuya: *See*—
Katsumata, Mitsuo; Kondo, Tetsuya; and Watanabe, Takeshi, 4,170,208, Cl. 123-148.0CC.

Kondo, Yukio; Kawabata, Minoru; and Suzuki, Mikio, to Toyoda-Koki Kabushiki-Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid pump with a continuously variable speed converter. 4,170,438, Cl. 417-223.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Shimokura, Toshiko, 4,170,403, Cl. 350-216.000.

Koon, David L., to United States Steel Corporation. Protective device for roll stands and the like. 4,170,121, Cl. 72-1.000.

Koppehele, Frithjof, to Siemens Aktiengesellschaft. Remotely powered intermediate amplifier for communications transmission. 4,170,761, Cl. 330-166.000.

Koppers Company, Inc.: *See*—
Kamody, John F., 4,170,550, Cl. 210-23.00H.

Korf-Stahl AG: *See*—
Elsner, Emil, 4,170,712, Cl. 13-10.000.

Korsak, Kazimierz. Helicopter primary flight controls. 4,170,437, Cl. 416-130.000.

Koser, Rolf. Trimming pipe bends. 4,170,157, Cl. 83-472.000.

Koski, William E.: *See*—
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,170,632, Cl. 424-48.000.
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,170,633, Cl. 424-48.000.

Koslosky, Roberta S. Infant's rattle. 4,170,106, Cl. 46-193.000.

Koss Corporation: *See*—
Larsen, Paul F., 4,170,275, Cl. 181-129.000.

Kosseim, Alexander J.; Dunnery, David A.; and Atwood, Gilbert R., to Union Carbide Corporation. Process for removing SO_2 from effluent gases and for removing heat stable salts from systems in which they accumulate using an anion exchange resin. 4,170,628, Cl. 423-243.000.

Kotitschke, Ronald: *See*—
Stephan, Wolfgang; and Kotitschke, Ronald, 4,170,590, Cl. 260-112.00B.

Kowa Company, Ltd.: *See*—
Yamada, Shun-Ichi; Terashima, Shiro; Nagakura, Masahiko; and Nara, Munehiko, 4,170,596, Cl. 260-326.470.

Kowalski, Anthony M.: *See*—
Masak, Raymond J.; Baurle, Herbert F.; and Kowalski, Anthony M., 4,170,775, Cl. 343-100.0LE.

Koyo Seiko Company Limited: *See*—
Okuda, Hiroji, 4,170,726, Cl. 219-121.0LM.

Kraft, Heinz-Peter, to Siemens Aktiengesellschaft. Optical component element. 4,170,396, Cl. 350-3.700.

Kraftwerk Union Aktiengesellschaft: *See*—
Remberg, Axel; and Triesch, Willi, 4,170,364, Cl. 277-53.000.

Kratky, Otto; Leopold, Hans; and Stabinger, Hans. Apparatus for density determination. 4,170,128, Cl. 73-30.000.

Kress Corporation: *See*—
Kress, Edward S.; LaBerdia, William L.; Medley, Jackson C.; and Pinter, Merrill E., 4,170,434, Cl. 414-459.000.

Kress, Edward S.; LaBerdia, William L.; Medley, Jackson C.; and Pinter, Merrill E., to Kress Corporation. Load handling apparatus. 4,170,434, Cl. 414-459.000.

Kroplinski, Thaddeus F.; and Case, Barton C., to N L Industries, Inc. Hollow fiber separatory device. 4,170,559, Cl. 210-321.00A.

Krumholz, Jerrold J.: *See*—
Freelander, Israel R.; and Krumholz, Jerrold J., 4,170,083, Cl. 46-29.000.

Kruper, Wayne A.: *See*—
Kirman, Lyle E.; and Kruper, Wayne A., 4,170,525, Cl. 204-23.000.

Kryczun, Alfred: *See*—
Megerle, Friedrich; Kryczun, Alfred; and Jakobs, Willy, 4,170,344, Cl. 266-204.000.

Kubinski, Donald C., to Goodyear Tire & Rubber Company, The. Tire building apparatus. 4,170,509, Cl. 156-405.00R.

Kuck, Kenneth D.: *See—*
Lemeshewsky, George P.; Dando, Thomas O.; Shope, Arthur R., Jr.; and Kuck, Kenneth D., 4,170,415, Cl. 355-22.000.

Kuehl, Donald R.; Mueller, David C.; and Meyers, George L., to American Can Company. Multi-product carton with product retaining features. 4,170,295, Cl. 206-45.340.

Kuehnle, Manfred R.; and Hagenlocher, Arno K., to Coulter Information Systems, Inc. High speed electrophotographic method. 4,170,475, Cl. 96-1.00C.

Kuhlmann, Gordon J.: *See—*
Pancholy, Ranjeet K.; Kuhlmann, Gordon J.; and Phillips, D. Howard, 4,170,666, Cl. 427-82.000.

Kuklies, Karl: *See—*
Sommerfeldt, Heinz; and Kuklies, Karl, 4,170,395, Cl. 339-259.00F.

Kumagai, Naotake; and Tatemoto, Minoru, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Air conditioning display system for vehicles. 4,170,259, Cl. 165-11.000.

Kundinger, Kurt: *See—*
Helm, Herbert; Kundinger, Kurt; and Schanz, Karl-Heinz, 4,170,094, Cl. 52-821.000.

Kuntzel, Heiner: *See—*
Dubs, Paul; and Kuntzel, Heiner, 4,170,594, Cl. 548-229.000.

Kunz, Peter, to Mettler Instrumente AG. Pre-load compensated weighing apparatus. 4,170,269, Cl. 177-165.000.

Kurtz, Abraham N.; Cunningham, Robert W.; and Naumann, Alfred W., to Union Carbide Corporation. Oxidation catalyst prepared with NH_3. 4,170,572, Cl. 252-455.00R.

Kuzin, Gennady I.: *See—*
Bobrov, Gennady N.; Shishkov, Mikhail I.; Kuzin, Gennady I.; Ivanov, Evgeny G.; and Akimov, Igor M., 4,170,737, Cl. 250-442.000.

Kwiatkowski, Jerome A.: *See—*
Borror, Phillip E.; and Kwiatkowski, Jerome A., 4,170,130, Cl. 73-49.100.

LaBarbera, Mannie. Over-cap closure device. 4,170,316, Cl. 220-306.000.

Labaz: *See—*
Gero, Stephan; Mercier, Daniel; Olesker, Alain; and Cier, Andre, 4,170,643, Cl. 424-181.000.

Laber, Walter; Vogl, Rudolf; and Fahrnschon, Wolfgang, to Deggendorfer Werft und Eisenbau GmbH. Tube sheet connection to vessel containing a bundle of tubes. 4,170,263, Cl. 165-158.000.

LaBerdia, William L.: *See—*
Kress, Edward S.; LaBerdia, William L.; Medley, Jackson C.; and Pinter, Merrill E., 4,170,434, Cl. 414-459.000.

Labes, Mortimer M.: *See—*
Love, Peter; and Labes, Mortimer M., 4,170,477, Cl. 96-36.200.

Lachaussee, Maurice, to Etablissements Lachaussee, Societe Anonyme. Linear transfer device for displacing bodies on an assembly machine. 4,170,284, Cl. 198-345.000.

LaFleur, Linda L.: *See—*
Engel, Michael R.; Chang, Robert W. H.; and LaFleur, Linda L., 4,170,636, Cl. 424-52.000.

Laing, Ingeborg: *See—*
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,170,261, Cl. 165-104.00S.

Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver. Heat storage device. 4,170,261, Cl. 165-104.00S.

Laing, Oliver: *See—*
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,170,261, Cl. 165-104.00S.

Laitram Corporation, The: *See—*
Lapeyre, James M., 4,170,281, Cl. 198-844.000.

Lalancette, Jean-Marc; and Coupal, Bernard, to Johnson & Johnson. Process for bleaching peat moss and resulting product. 4,170,515, Cl. 162-92.000.

Laliberte, Real: *See—*
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,170,653, Cl. 424-267.000.

Lamberti, Vincent, to Lever Brothers Company. Carboxymethyloxysuccinic anhydrides, halides and derivatives thereof. 4,170,607, Cl. 260-501.170.

Lamont, Lawrence T., Jr., to Varian Associates, Inc. Rotating resonator for large substrate tables in sputtering systems. 4,170,541, Cl. 204-298.000.

Lampson, Neil F., to Riggers Manufacturing Company. Counterbalanced tower crane. 4,170,309, Cl. 212-48.000.

Lane, Richard J.; and Ellis, Gordon, to Creda Electric Limited. Control systems for or in association with storage heaters. 4,170,729, Cl. 219-364.000.

Lang, Helmut; Overath, Horst; and Priester, Heinz-Werner, to GST-Regeltechnik GmbH. Process and apparatus for the controlled flocculating or precipitating of foreign substances from a liquid. 4,170,553, Cl. 210-49.000.

Lang, John M., to Boeing Company, The. Cargo shuttle. 4,170,292, Cl. 198-746.000.

Lapeyre, James M., to Laitram Corporation, The. Extrudable flexible modular tooth driven conveyor belt. 4,170,281, Cl. 198-844.000.

Large, George B., to Stauffer Chemical Company. 2,6-Dialkyl-N-dialkylphosphonomethyl chloroacetanilides as herbicides. 4,170,463, Cl. 71-86.000.

Larsen, Paul F., to Koss Corporation. Ear cushion. 4,170,275, Cl. 181-129.000.

Latour, Mireille J.: *See—*
Murphy, Preston V.; and Latour, Mireille J., 4,170,185, Cl. 114-222.000.

Lauber, Josef: *See—*
Behn, Reinhard; Lauber, Josef; Preibinger, Karl-Heinz; and Rheindorf, Hans-Heinz, 4,170,665, Cl. 427-79.000.

Lavallee, Francois A.: *See—*
Orlando, Charles M.; and Lavallee, Francois A., 4,170,711, Cl. 568-610.000.

Lazarz, Christine A.; Cook, Edward H., Jr.; and Scripa, Lesleigh V., to Hooker Chemicals & Plastics Corp. Method for forming microporous membrane materials. 4,170,540, Cl. 204-296.000.

Leadbetter, Graham. Method for isolating insect sex pheromones. 4,170,601, Cl. 260-428.500.

Lectret S.A.: *See—*
Murphy, Preston V.; and Latour, Mireille J., 4,170,185, Cl. 114-222.000.

Lee, Calvin K.; and Chaiken, Robert F., to United States of America, Interior. Method for wood precharring. 4,170,668, Cl. 427-223.000.

Leech, Leslie A.; and Riddoch, Henry J., to Pico Electronics Limited. Gramophone equipment. 4,170,359, Cl. 274-10.00R.

LeFaucheur, Claude: *See—*
Greiner, Henri; and LeFaucheur, Claude, 4,170,255, Cl. 152-361.0FP.

Leffler, James M., to Reliance Electric Co. Method of adjusting end play. 4,170,058, Cl. 29-596.000.

Lemeshewsky, George P.; Dando, Thomas O.; Shope, Arthur R., Jr.; and Kuck, Kenneth D., to United States of America, Interior. System for producing orthophotographs. 4,170,415, Cl. 355-22.000.

Leonhart, Xaver F. Table football game with actuating rods. 4,170,353, Cl. 273-85.00D.

Leopold, Hans: *See—*
Kratky, Otto; Leopold, Hans; and Stabinger, Hans, 4,170,128, Cl. 73-30.000.

Lerner, Moisey M.: *See—*
Frusztajer, Boruch B.; and Lerner, Moisey M., 4,170,739, Cl. 307-2.000.

Lever Brothers Company: *See—*
Edwards, John R.; Rennie, George K.; Rosser, David A.; and Smart, Colin, 4,170,681, Cl. 428-205.000.
Lamberti, Vincent, 4,170,607, Cl. 260-501.170.

Levina, Margarita Y.: *See—*
Butseniex, Imant E.; Levina, Margarita Y.; Prostyakov, Alexandr A.; Stolov, Mikhail Y.; Sharamkin, Vladimir I.; and Scherbinin, Eduard V., 4,170,713, Cl. 13-29.000.

Lewis, George D.; and Shadowen, James H., to United Technologies Corporation. Thrust augmentor. 4,170,111, Cl. 60-261.000.

Lewis, Robert B., to Du Pont de Nemours, E. I., and Company. Web pleater. 4,170,347, Cl. 270-94.000.

Liautaud, James P., to American Antenna Corporation. Mobile antenna. 4,170,777, Cl. 343-715.000.

Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Budden, Renke; and Bahlsen, Jacqueline, to Kali-Chemie Pharma GmbH. 1,4-Benzodiazepine derivatives, pharmaceutical compositions thereof, and process for their preparation. 4,170,649, Cl. 424-244.000.

Lillig, John E.: *See—*
Buzza, Edmund E.; and Lillig, John E., 4,170,523, Cl. 204-1.00T.

Lindner, Daniel J.: *See—*
Buchanan, Jack W.; and Lindner, Daniel J., 4,170,503, Cl. 156-116.000.

Lindquist, Steven G. Lubricating fitting for a conveyor track wheel. 4,170,277, Cl. 184-105.00C.

Link, William J.: *See—*
Knight, Patricia M.; and Link, William J., 4,170,043, Cl. 3-13.000.
Knight, Patricia M.; and Link, William J., 4,170,661, Cl. 427-2.000.

Lippmann, Wilbur: *See—*
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,170,653, Cl. 424-267.000.

Lipscomb, Thomas G., II; Morgan, Walter A.; and Bethea, Sam R., to Exxon Research & Engineering Co. Electrical insulating oil. 4,170,543, Cl. 208-14.000.

Liu, Chao-Min: *See—*
Westley, John; and Liu, Chao-Min, 4,170,595, Cl. 260-325.00R.

Liu, Daniel T. H.; Irwin, John F.; and Pai, Rong-Chang, to Warner-Lambert Company. Antihemophilic factor concentrate and its production. 4,170,639, Cl. 424-101.000.

Lloyd, Robert; and Turner, Maxwell J., to Energy Recycling Corporation Pty. Ltd. Container. 4,170,312, Cl. 224-4.00B.

Longbrake, Howard R. Knife sharpener. 4,170,343, Cl. 269-3.000.

Longshore, Randolph E.: *See—*
Cox, John T.; Garber, Michael B.; Jasper, Marilyn A.; and Longshore, Randolph E., 4,170,781, Cl. 357-30.000.

Looker, Olin L. Steering system for personnel carrier. 4,170,271, Cl. 180-211.000.

L'Oreal: *See—*
Grollier, Jean-Francois; Monnais, Christian; and Fourcadier, Chantal, 4,170,452, Cl. 8-10.200.

Loup, Ronald L.: *See—*
Gill, Arthur W.; and Loup, Ronald L., 4,170,214, Cl. 137-269.000.

Loutaty, Roben: *See—*
Atlani, Martial; Corso, Vincent; Wakselman, Claude; Loutaty, Roben; and Yacono, Charles, 4,170,547, Cl. 208-326.000.

Love, Peter; and Labes, Mortimer M., to Temple University. Method for making polysulfur nitride and product thereof. 4,170,477, Cl. 96-36.200.

Lowe, Warren, to Chevron Research Company. Lubricating oil antioxidant additive composition. 4,170,560, Cl. 252-47.500.

Lowell, Seymour. Method of determining pore volume distribution of a powder sample by mercury intrusion. 4,170,129, Cl. 73-38.000.

Lucas Industries Limited: *See—*
Joyes, John F., 4,170,750, Cl. 318-345.00C.

Luff, Donald G., to Combustion Engineering, Inc. Skid pipe covering. 4,170,451, Cl. 432-234.000.

Luke, Patrick, to Mego Corp. Doll with growing hair. 4,170,085, Cl. 46-135.00R.

Lynch, Basil P.: *See—*
Beetschen, Robert E.; Lynch, Basil P.; and Short, Allie A., 4,170,682, Cl. 428-267.000.

M & T Chemicals Inc.: *See—*
Mansukhani, Ishwar R., 4,170,482, Cl. 106-20.000.

MacDoran, Peter F.: *See—*
United States of America, National Aeronautics and Space Administration; and MacDoran, Peter F., 4,170,776, Cl. 343-112.00D.

MacGregor, Robert, to Dreis & Krump Manufacturing Company. Hydraulic control system for press brakes and the like. 4,170,124, Cl. 72-389.000.

Machida, Naoyosi, to Kai Cutlery Center Co., Ltd. Extensible knife with blade position adjustment. 4,170,062, Cl. 30-162.000.

Mack, Michael E.; and Woodroffe, Jaime A., to Jersey Nuclear-Avco Isotopes, Inc. Flow channel for fluid medium laser. 4,170,762, Cl. 331-94.50D.

Maddock, Paul T. Apparatus for supplying fluid media to the internal surface of a tubular workpiece. 4,170,192, Cl. 118-306.000.

Maeda, Hiroaki: *See—*
Mizuno, Kiyohumi; Maeda, Hiroaki; and Takahashi, Shigeo, 4,170,153, Cl. 74-868.000.

Maeda, Kenji: *See—*
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,170,642, Cl. 424-180.000.

Maeder, Edward C. Service module. 4,170,307, Cl. 211-60.00T.

Magnetic Analysis Corporation: *See—*
Mansson, Sven E., 4,170,755, Cl. 324-238.000.

Magnus, Harve W.; and Masur, Vincent J., to Teledyne Sprague Engineering Division of Teledyne, Inc. Process for cleaning jet engine nozzles. 4,170,489, Cl. 134-22.00R.

Makishima, Sadao: *See—*
Kodama, Masayuki; Takano, Toshio; and Makishima, Sadao, 4,170,273, Cl. 180-233.000.

Malis, Leonard I. Suspension apparatus for operating room microscope. 4,170,336, Cl. 248-276.000.

Malpass, Dennis B.; and Watson, Spencer C., to Stauffer Chemical Company. Production of dialkylaluminum hydrides. 4,170,604, Cl. 260-448.00A.

Manier, Francis: *See—*
Caron, Patrick; and Manier, Francis, 4,170,780, Cl. 346-141.000.

Mankau, Dieter: *See—*
Sobotta, Reinhard; and Mankau, Dieter, 4,170,409, Cl. 353-119.000.

Mann, Jerry; and Schultz, Theodore. Sighting apparatus. 4,170,071, Cl. 33-265.000.

Manners, David E.: *See—*
Baker, Scott H.; and Manners, David E., 4,170,784, Cl. 358-190.000.

Mannesmann Aktiengesellschaft: *See—*
Ries, Karl; Kaiser, Dieter; Quaye, Mesa; Boms, Heinz-Jurgen; and Jannsen, Klaus-Uwe, 4,170,143, Cl. 73-609.000.

Manowitz, Milton: *See—*
Brandman, Harold A.; Freudewald, Joachim E.; Manowitz, Milton; Nikawitz, Edward J.; and Sharpell, Frederick H., Jr., 4,170,704, Cl. 546-290.000.

Mansson, Sven E., to Magnetic Analysis Corporation. FM transmitter and receiver for use with non-destructive testing apparatus including a moveable head. 4,170,755, Cl. 324-238.000.

Mansukhani, Ishwar R., to M & T Chemicals Inc. Jet printing ink composition containing an acetylenic compound and a lactone. 4,170,482, Cl. 106-20.000.

Marco, Francis W., to Milliken Research Corporation. Process and composition for imparting anti-soil redeposition and soil release properties to polyester textile materials. 4,170,557, Cl. 252-8.600.

Marcus, Bruce D.; and Edwards, Donald K., to TRW Inc. Graded pore size heat pipe wick. 4,170,262, Cl. 165-105.000.

Marie, Gilbert: *See—*
Chapelet, Gilbert; Knoche, Hubert; and Marie, Gilbert, 4,170,561, Cl. 252-51.50A.

Marquip, Inc.: *See—*
Marschke, Carl R., 4,170,506, Cl. 156-159.000.

Marschke, Carl R., to Marquip, Inc. Method of web splicing. 4,170,506, Cl. 156-159.000.

Marshall, Dennis L.; and Matuszewski, Anthony, to Globe-Union Inc. High strength lead alloy. 4,170,470, Cl. 75-166.00D.

Marshall, William F.; and Arild, Tor, to Ultra-Sort Corp. Control apparatus for sorting products. 4,170,306, Cl. 209-549.000.

Marthaler, Eduard: *See—*
Zwicky, Paul; and Marthaler, Eduard, 4,170,361, Cl. 274-23.00A.
Zwicky, Paul; and Marthaler, Eduard, 4,170,362, Cl. 274-23.00A.

Marti, Herbert. Smoker's tool including a tobacco-presser means for pressing down lightened tobacco in a pipe. 4,170,238, Cl. 131-243.000.

Martin, Otis M.: *See—*
Miller, Silas N.; and Martin, Otis M., 4,170,342, Cl. 256-26.000.

Martineau, Tom M., to Stoelting, Inc. Level indicator for frozen confection dispenser. 4,170,136, Cl. 73-322.000.

Marubashi, Kiyonobu, to Denki Kagaku Kogyo Kabushiki Kaisha. Flexible epoxy resin composition. 4,170,613, Cl. 525-403.000.

Marvtek, Corporation: *See—*
Austin, James W.; Morris, Oscar L.; and Rothrock, Michael E., 4,170,765, Cl. 367-100.000.

Masak, Raymond J.; Baurle, Herbert F.; and Kowalski, Anthony M., to United States of America, Air Force. Communication system beamport sidelobe canceller. 4,170,775, Cl. 343-100.0LE.

Maschinenfabrik Rissen GmbH: *See—*
Wommelsdorf, Fritz, 4,170,172, Cl. 93-94.0FC.

Masclet, Jean; and Turiot, Andre, to Messier-Hispano-Bugatti. Retractable undercarriage especially for the fuselage of an aircraft. 4,170,332, Cl. 244-102.00R.

Mase, Shunzo: *See—*
Watanabe, Tetsuo; Wada, Shigetaka; and Mase, Shunzo, 4,170,531, Cl. 204-195.00S.

Maselli, James M.: *See—*
Ernest, Michael V.; and Maselli, James M., 4,170,573, Cl. 252-462.000.

Massachusetts Institute of Technology: *See—*
Flanders, Dale C.; Smith, Henry I.; and Dalomba, Muriel A., 4,170,512, Cl. 156-631.000.
Suh, Nam P.; and Tucker, Charles L., III, 4,170,319, Cl. 222-134.000.
Weaver, James C., 4,170,520, Cl. 435-288.000.

Massey-Ferguson Industries Limited: *See—*
Ashton, Robert; and Weber, Wilbert D., 4,170,235, Cl. 130-27.00T.

Masuda, Takao: *See—*
Ikenoue, Shinpei; Masuda, Takao; Katsuyama, Harumi; Sekikawa, Nobuyoshi; Shishido, Tadao; and Sakai, Nobuo, 4,170,480, Cl. 96-114.100.

Masumoto, Yutaka: *See—*
Hashimoto, Komei; Komatsubara, Masahiro; Yasuda, Shinji; Masumoto, Yutaka; and Satoh, Kazuhiko, 4,170,788, Cl. 360-129.000.

Masur, Vincent J.: *See—*
Magnus, Harve W.; and Masur, Vincent J., 4,170,489, Cl. 134-22.00R.

Mathematical Sciences Northwest, Inc.: *See—*
Hertzberg, Abraham; and Russell, David A., 4,170,330, Cl. 244-3.130.

Mathews, Will W., to Cummins Engine Company, Inc. Method of balancing a rotatable element. 4,170,528, Cl. 204-129.200.

Mathieu, Francis D. A., to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris". Installation for inspecting and repairing installations in deep water. 4,170,429, Cl. 405-195.000.

Matsuki, Masamitsu, to Nissan Motor Company, Ltd. Composite board structure using a corrugated fiberboard and a method of and an apparatus for producing the composite board structure. 4,170,674, Cl. 428-90.000.

Matsumoto, Yoshio: *See—*
Aiuchi, Susumu; Ikeda, Minoru; and Matsumoto, Yoshio, 4,170,418, Cl. 356-400.000.

Matsumoto, Yutaka: *See—*
Saito, Minoru; and Matsumoto, Yutaka, 4,170,155, Cl. 83-76.000.

Matsushita Electric Industrial Company: *See—*
Ueda, Yasukiyo; Mori, Keijiro; Mori, Keiichi; Tanahashi, Takashi; and Shirai, Shigeru, 4,170,339, Cl. 251-138.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Inoue, Satoshi, 4,170,789, Cl. 360-137.000.

Mattison, Grant G., to Jones-Hamilton Co. Foot liquid dispenser. 4,170,046, Cl. 4-182.000.

Matumoto, Iwao: *See—*
Narita, Kiichi; Hara, Hiroshi; Taniguchi, Masayuki; Yamaguchi, Masaru; and Matumoto, Iwao, 4,170,139, Cl. 73-425.600.

Matuszewski, Anthony: *See—*
Marshall, Dennis L.; and Matuszewski, Anthony, 4,170,470, Cl. 75-166.00D.

Mayes, C. C. Andirons having rear end locking means. 4,170,217, Cl. 126-121.000.

McArthur, Donald A. Bakery mix dispenser having pump actuated outlet gate. 4,170,253, Cl. 141-362.000.

McCabe, Stanley G. Paper towel dispenser. 4,170,390, Cl. 312-37.000.

McDonald, Walter; and Seitel, Norbert J., to Charles E. Green & Sons, Inc. Paint roller cage assembly apparatus. 4,170,289, Cl. 198-479.000.

McGee, Derek J.: *See—*
Spicer, Leonard A.; McGee, Derek J.; and Elson, Ian H., 4,170,687, Cl. 428-421.000.

McIver, John F.: *See—*
Yohe, Robert A.; and McIver, John F., 4,170,067, Cl. 33-143.00L.

McMordie, Warren C., Jr.: *See—*
Bennett, Robert B.; McMordie, Warren C., Jr.; and Taylor, William H., 4,170,248, Cl. 138-97.000.

McNally, Paul F., to Contraves Goerz Corporation. Linear positioning apparatus. 4,170,159, Cl. 83-562.000.

Mead Corporation, The: *See—*
Shackle, Dale R.; and Schwab, Gerhart, 4,170,483, Cl. 106-21.000.

Mebus, Henry R., to Harris Corporation. Signature handling system. 4,170,288, Cl. 198-440.000.

Medley, Jackson C.: *See—*
Kress, Edward S.; LaBerdia, William L.; Medley, Jackson C.; and Pinter, Merrill E., 4,170,434, Cl. 414-459.000.

Mefina S.A.: *See—*
Fresard, Marcel; and Raboud, Norbert, 4,170,184, Cl. 112-317.000.

Megerle, Friedrich; Kryczun, Alfred; and Jakobs, Willy, to Klockner-Humbolt-Deutz AG. Apparatus for the separation of a mixture of components, particularly molten metals, metal compounds and/or metal containing slags in a centrifugal force field. 4,170,344, Cl. 266-204.000.

Mego Corp.: *See—*
Luke, Patrick, 4,170,085, Cl. 46-135.00R.

Meiji Seika Kaisha, Ltd.: *See—*
Akita, Eiichi; Horiuchi, Yukio; Miyazawa, Takeo; and Umezawa, Hamao, 4,170,641, Cl. 424-180.000.

Menayan, Victor V.: *See—*
Balding, David P.; and Menayan, Victor V., 4,170,421, Cl. 366-144.000.

Menzel, Gerhard: *See—*
Hegenberg, Peter, deceased; Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helmut; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, 4,170,588, Cl. 260-45.80N.

Mercier, Daniel: *See—*
Gero, Stephan; Mercier, Daniel; Olesker, Alain; and Cier, Andre, 4,170,643, Cl. 424-181.000.

Merck & Co., Inc.: *See—*
Stone, Clement A., 4,170,654, Cl. 424-283.000.

Meriadec, Brigette; and Roubertie, Patrice, to Union Carbide Corporation. Process for the preparation of a solid-phase radioimmunoassay support and use thereof. 4,170,454, Cl. 23-230.600.

Merit Plastics, Inc.: *See—*
Olson, Daniel H.; Hunsicker, Larry R.; and Johnson, Stanley A., 4,170,151, Cl. 74-501.00R.

Merle, Joseph J.: *See—*
Weierman, Robert J.; Merle, Joseph J.; Gordon, Gerald A.; Pan, Peter N. Y.; and Hernandez, Rafael J., 4,170,314, Cl. 220-260.000.

Merrill, Stewart H.; and Santilli, Domenic, to Eastman Kodak Company. Liquid electrographic developer comprising polymeric phosphonate dispersing agent. 4,170,563, Cl. 252-62.10L.

Merten, Rudolf: *See—*
Rottmaier, Ludwig; and Merten, Rudolf, 4,170,701, Cl. 528-49.000.

Messier-Hispano-Bugatti: *See—*
Masclet, Jean; and Turiot, Andre, 4,170,332, Cl. 244-102.00R.

Metivier, Roger M.: *See—*
Minor, Robert N.; and Metivier, Roger M., 4,170,199, Cl. 122-33.000.

Mettler Instrumente AG: *See—*
Kunz, Peter, 4,170,269, Cl. 177-165.000.

Meuschke, Robert E.; Desmarchais, Walter E.; and Katz, Leonard R., to Westinghouse Electric Corp. Permanent seal ring for a nuclear reactor cavity. 4,170,517, Cl. 176-87.000.

Meye, Wolfgang; and Schmidt, Ludwig, to Siemens Aktiengesellschaft. Mounting structure for optical assemblies in nonmechanical printers. 4,170,404, Cl. 350-252.000.

Meyers, George L.: *See—*
Kuehl, Donald R.; Mueller, David C.; and Meyers, George L., 4,170,295, Cl. 206-45.340.
Pawlowski, Thomas D.; and Meyers, George L., 4,170,325, Cl. 229-17.00B.

Meyst, Richard P.; and Porten, Ronald M., to Baxter Travenol Laboratories, Inc. Blood filter. 4,170,056, Cl. 29-163.50F.

Michalski, Stanislaw; and Fabrycy, Marian, to Przemyslowy Instytut Automatyki i Pomiarow "MERA-PIAP. Diagnostic equipment for the internal combustion, carburetor type engines. 4,170,753, Cl. 324-384.000.

Micro Peripherals, Inc.: *See—*
Owens, William M., 4,170,146, Cl. 74-89.200.

Midland-Ross Corporation: *See—*
Breisch, John H., 4,170,167, Cl. 91-491.000.

Miklos, Richard L., to Minnesota Mining and Manufacturing Company. Reflective sense marker for magnetic recording tape. 4,170,683, Cl. 428-336.000.

Milkowski, Wolfgang: *See—*
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Budden, Renke; and Bahlsen, Jacqueline, 4,170,649, Cl. 424-244.000.

Miller, Arthur O. Programming and selection monitoring system for television receivers. 4,170,782, Cl. 358-84.000.

Miller Fluid Power Corporation: *See—*
Howell, Melvyn J.; and Pilch, Raymond C., 4,170,731, Cl. 250-227.000.

Miller, George A.: *See—*
Owen, Ronald P.; Miller, George A.; and Schneider, Charles M., 4,170,648, Cl. 424-200.000.

Miller, Silas N.; and Martin, Otis M. Pivotal roof fence apparatus. 4,170,342, Cl. 256-26.000.

Miller, Stephen J., to Chevron Research Company. Hydrocracking process including upgrading of bottoms fraction of the product. 4,170,544, Cl. 208-96.000.

Miller, William A.; Opsasnick, John P.; and Miller, William A., to Allied Chemical Corporation. Substrates and articles of manufacture incorporating a fluoropolymer primer coating. 4,170,686, Cl. 428-416.000.

Miller, William A.: *See—*
Miller, William A.; Opsasnick, John P.; and Miller, William A., 4,170,686, Cl. 428-416.000.

Milliken Research Corporation: *See—*
Brendle, Ralph N., 4,170,564, Cl. 252-68.000.
Marco, Francis W., 4,170,557, Cl. 252-8.600.

Milne, James A., to Pace Incorporated. Surface laminating machine. 4,170,511, Cl. 156-498.000.

Minka, Peter. Tool for crimping ferrules on conduits. 4,170,125, Cl. 72-410.000.

Minnesota Mining and Manufacturing Company: *See—*
Engel, Michael R.; Chang, Robert W. H.; and LaFleur, Linda L., 4,170,636, Cl. 424-52.000.
Miklos, Richard L., 4,170,683, Cl. 428-336.000.

Minolta Camera Kabushiki Kaisha: *See—*
Sekida, Minoru; and Kimura, Kazuo, 4,170,410, Cl. 354-23.00R.

Minor, Robert N.; and Metivier, Roger M., to Regor Energy Saver Inc. Closed heat transfer system. 4,170,199, Cl. 122-33.000.

Minox GmbH: *See—*
Behr, Karl-Gunther, 4,170,408, Cl. 353-72.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Watakabe, Yaichiro, 4,170,502, Cl. 148-191.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Kumagai, Naotake; and Tatemoto, Minoru, 4,170,259, Cl. 165-11.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Hirai, Yutaka; Miyata, Katsuharu; and Hasegawa, Seiji, 4,170,708, Cl. 560-24.000.

Miyata, Katsuharu: *See—*
Hirai, Yutaka; Miyata, Katsuharu; and Hasegawa, Seiji, 4,170,708, Cl. 560-24.000.

Miyazaki, Katsuyuki; and Horiki, Akira. Immediate ring-back control system for time-division telephone exchange. 4,170,718, Cl. 179-15.0BY.

Miyazawa, Takeo: *See—*
Akita, Eiichi; Horiuchi, Yukio; Miyazawa, Takeo; and Umezawa, Hamao, 4,170,641, Cl. 424-180.000.

Mizokawa, Sadao, to Hitachi, Ltd. Data communication system. 4,170,715, Cl. 178-68.000.

Mizuno, Kiyohumi; Maeda, Hiroaki; and Takahashi, Shigeo, to Aisin Seiki Kabushiki Kaisha. Hydromechanical transmission. 4,170,153, Cl. 74-868.000.

Mizutani, Katuzi: *See—*
Fujii, Sumihide; Fukinbara, Hazime; Mizutani, Katuzi; Nishibe, Minoru; and Ishii, Yoshitomo, 4,170,494, Cl. 148-12.00B.

Mobil Oil Corporation: *See—*
Herrington, F. John, Jr., 4,170,450, Cl. 425-464.000.

Mobsby, John A., to Rolls-Royce Limited. Fuel injectors for gas turbine engines. 4,170,108, Cl. 60-39.74R.

Mocek, Aloysius M., Jr.; and Oak, George A., to Power Industries Inc., Division of Groman Corporation. Electrical connector with replaceable contacts. 4,170,393, Cl. 339-63.00M.

Modulus Corporation: *See—*
Payne, William J., 4,170,163, Cl. 85-62.000.

Molins, Ltd.: *See—*
Hinchcliffe, Dennis, 4,170,285, Cl. 198-347.000.

Monnais, Christian: *See—*
Grollier, Jean-Francois; Monnais, Christian; and Fourcadier, Chantal, 4,170,452, Cl. 8-10.200.

Monsanto Company: *See—*
Hirsch, Richard H., 4,170,702, Cl. 528-219.000.

Montacie, Marcel, to Bouygues. Tunneling machines and other cutting machines. 4,170,383, Cl. 299-56.000.

Montalvo, Fernando C.: *See—*
Moreno, Miguel A. P.; Cil, Jorge A.; Montero, Justo B.; Novais, Guillermo B.; Morales, Jose A. R.; Montalvo, Fernando C.; Rivero, Armando A.; Castro, Mario J. M.; and Suarez, Jacinto F., 4,170,098, Cl. 56-13.900.

Montero, Justo B.: *See—*
Moreno, Miguel A. P.; Cil, Jorge A.; Montero, Justo B.; Novais, Guillermo B.; Morales, Jose A. R.; Montalvo, Fernando C.; Rivero, Armando A.; Castro, Mario J. M.; and Suarez, Jacinto F., 4,170,098, Cl. 56-13.900.

Mookherjee, Braja D.: *See—*
Kamath, Venkatesh; Mookherjee, Braja D.; and Schmitt, Frederick L., 4,170,577, Cl. 252-522.000.
Withycombe, Donald A.; Mookherjee, Braja D.; Vock, Manfred H.; and Vinals, Joaquin F., 4,170,236, Cl. 131-2.000.

Moon, Edward L.: *See—*
Skinner, David L.; and Moon, Edward L., 4,170,658, Cl. 423-430.000.

Moore, Sidney E.: *See—*
Beasley, Marion W.; Swenson, Dale R.; Moore, Sidney E.; Brooking, Hurley R.; and Carroll, Harlan L., 4,170,170, Cl. 93-37.00R.

Morales, Jose A. R.: *See—*
Moreno, Miguel A. P.; Cil, Jorge A.; Montero, Justo B.; Novais, Guillermo B.; Morales, Jose A. R.; Montalvo, Fernando C.; Rivero, Armando A.; Castro, Mario J. M.; and Suarez, Jacinto F., 4,170,098, Cl. 56-13.900.

Moreno, Miguel A. P.; Cil, Jorge A.; Montero, Justo B.; Novais, Guillermo B.; Morales, Jose A. R.; Montalvo, Fernando C.; Rivero, Armando A.; Castro, Mario J. M.; and Suarez, Jacinto F. Apparatus for harvesting sugar cane. 4,170,098, Cl. 56-13.900.

Morgan, Barrie O.: *See—*
Branscome, Kenneth M.; Morgan, Barrie O.; and Carter, Merlon B., 4,170,714, Cl. 178-22.000.

Morgan, Walter A.: *See—*
Lipscomb, Thomas G., II; Morgan, Walter A.; and Bethea, Sam R., 4,170,543, Cl. 208-14.000.

Mori, Kaoru; Tanaka, Hiro; Ozawa, Hirosi; and Murakami, Yoichi, to Dainippon Ink and Chemicals, Inc. Process for preparing a polymer resin aqueous dispersion. 4,170,582, Cl. 260-29.6RW.

Mori, Keiichi: *See*—
Ueda, Yasukiyo; Mori, Keijiro; Mori, Keiichi; Tanahashi, Takashi; and Shirai, Shigeru, 4,170,339, Cl. 251-138.000.

Mori, Keijiro: *See*—
Ueda, Yasukiyo; Mori, Keijiro; Mori, Keiichi; Tanahashi, Takashi; and Shirai, Shigeru, 4,170,339, Cl. 251-138.000.

Mori, Kouichi; Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; and Morino, Seiji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition system for rotary piston engines. 4,170,212, Cl. 123-211.000.

Mori, Sanae, to Daido Metal Company Ltd. Aluminum base bearing alloy and a composite bearing made of the alloy with a steel backing plate. 4,170,469, Cl. 75-141.000.

Morino, Seiji: *See*—
Mori, Kouichi; Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; and Morino, Seiji, 4,170,212, Cl. 123-211.000.

Moriya, Koichi; and Honda, Iwao, to Japan Carlit Co., Ltd., The. Process for coating paper with a water soluble thermosetting resin. 4,170,672, Cl. 427-391.000.

Morris, James C.; and Garrison, Robert L., to GTE Sylvania Incorporated. Audio-detector alarm. 4,170,769, Cl. 340-384.00E.

Morris, Nancy J.; and Bozzelli, John W., to Dow Chemical Company, The. Oxopiperazinium salts, their preparation and their use. 4,170,650, Cl. 424-250.000.

Morris, Oscar L.: *See*—
Austin, James W.; Morris, Oscar L.; and Rothrock, Michael E., 4,170,765, Cl. 367-100.000.

Moss, Ronald. Cushioned foot sole. 4,170,078, Cl. 36-28.000.

Motegi, Akira; and Kimura, Kaoru, to Toagosei Chemical Industry Co., Ltd. Adhesive composition. 4,170,585, Cl. 260-33.20R.

Motes, John M., to Dow Chemical Company, The. Aziridine complexes isomerize to form chelated dimers. 4,170,591, Cl. 260-239.00E.

Motorola, Inc.: *See*—
Frisbie, Milo W.; and Swapp, Mavin C., 4,170,290, Cl. 198-524.000.
Hilbert, Francis H.; and Parker, Norman W., 4,170,716, Cl. 179-1.0GS.
Keeling, Michael C.; and Doss, Dwight E., 4,170,507, Cl. 156-245.000.
Olsen, Dennis R.; and Spanjer, Keith G., 4,170,472, Cl. 75-175.00A.
Petrie, Adelore F.; and Javeri, Rupin J., 4,170,209, Cl. 123-148.00E.
Rodgers, Michael A., 4,170,667, Cl. 427-86.000.
Stimple, James R.; and Erickson, Paul M., 4,170,759, Cl. 325-51.000.

Mouton, William J., Jr. Hydraulic well derrick with cable lifts. 4,170,340, Cl. 254-189.000.

Mrotzek, Richard. Fastening device. 4,170,430, Cl. 403-20.000.

Mucci, Ronald A.: *See*—
Pridham, Roger G.; Callahan, Andrew C.; and Mucci, Ronald A., 4,170,766, Cl. 367-135.000.

Mueller, David C.: *See*—
Kuehl, Donald R.; Mueller, David C.; and Meyers, George L., 4,170,295, Cl. 206-45.340.

Mueller, Richard A., to G. D. Searle & Co. 1-(Substituted amino)alkanoyl-2-(dibenzoxapine-10-carbonyl)hydrazines and derivatives thereof. 4,170,593, Cl. 260-243.300.

Muller, Rudolf: *See*—
Weber, Alfred; Kennecke, Mario; Popper, Alfred; Muller, Rudolf; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Neef, Gunter; and Wiechert, Rudolf, 4,170,518, Cl. 435-55.000.

Muller, Theo L. H.: *See*—
Beer, Henri B.; and Muller, Theo L. H., 4,170,527, Cl. 204-96.000.

Mullner, Paul; and Wildling, Ernst, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Container arrangement for treating lumpy and grained materials in a packed bed with gaseous media. 4,170,076, Cl. 34-217.000.

Mundt, Randall S.: *See*—
Bartlett, Keith G.; Jordan, Laurence R.; and Mundt, Randall S., 4,170,492, Cl. 148-1.500.

Murakami, Yoichi: *See*—
Mori, Kaoru; Tanaka, Hiro; Ozawa, Hirosi; and Murakami, Yoichi, 4,170,582, Cl. 260-29.6RW.

Murphy, Gary F., deceased: *See*—
Hahn, Ernest A.; Murphy, Gary F., deceased; and Bruckbauer, Gerald J., 4,170,663, Cl. 427-44.000.

Murphy, Mary Lou, administratrix: *See*—
Hahn, Ernest A.; Murphy, Gary F., deceased; and Bruckbauer, Gerald J., 4,170,663, Cl. 427-44.000.

Murphy, Preston V.; and Latour, Mireille J., to Lectret S.A. Preventing marine fouling. 4,170,185, Cl. 114-222.000.

Murray, Robert R.; and Jackson, Dale H., to Harris Corporation. Bindery caliper. 4,170,346, Cl. 270-54.000.

Myers, John E., to Owens-Corning Fiberglas Corporation. Method for collecting glass fibers. 4,170,459, Cl. 65-3.00R.

N L Industries, Inc.: *See*—
Kroplinski, Thaddeus F.; and Case, Barton C., 4,170,559, Cl. 210-321.00A.

Nabeshima, Shigeyasu: *See*—
Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, 4,170,696, Cl. 521-29.000.

Nadelson, Jeffrey, to Sandoz, Inc. Substituted hydroxy pyridones. 4,170,705, Cl. 546-296.000.

Naegeli, John P., to Sulzer Brothers Limited. Pivotally mounted bearing housing in which two turbo-machine shafts are rigidly coupled. 4,170,388, Cl. 308-15.000.

Nagakura, Masahiko: *See*—
Yamada, Shun-Ichi; Terashima, Shiro; Nagakura, Masahiko; and Nara, Munehiko, 4,170,596, Cl. 260-326.470.

Nagase, Tsuneyuki: *See*—
Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, 4,170,696, Cl. 521-29.000.

Nakagawa, Jihei, to Olympus Optical Co., Ltd. Very compact wide-angle zoom lens system. 4,170,402, Cl. 350-184.000.

Nakajyo, Noriaki; and Uchiyama, Toshihiko, to Nissan Motor Company, Ltd.; and Kokoku Rubber Industry Company, Ltd. Method of partially plating article or synthetic resin. 4,170,524, Cl. 204-15.000.

Nakamura, Kiyoko: *See*—
Saeki, Noriyoshi; and Nakamura, Kiyoko, 4,170,318, Cl. 222-455.000.

Nanjyo, Hirotoshi: *See*—
Katsumata, Mitsuo; and Nanjyo, Hirotoshi, 4,170,206, Cl. 123-148.0CC.

Nara, Munehiko: *See*—
Yamada, Shun-Ichi; Terashima, Shiro; Nagakura, Masahiko; and Nara, Munehiko, 4,170,596, Cl. 260-326.470.

Narita, Kiichi; Hara, Hiroshi; Taniguchi, Masayuki; Yamaguchi, Masaru; and Matumoto, Iwao, to Kobe Steel, Ltd. Sampling device for analysis of molten metal for hydrogen. 4,170,139, Cl. 73-425.600.

Nathan, Matthew L. Fluid-flow pressure-sensing device. 4,170,134, Cl. 73-212.000.

National Distillers & Chemical Corporation: *See*—
Thomas, James H., 4,170,676, Cl. 428-113.000.

National Machinery Company, The: *See*—
Berger, James R., 4,170,123, Cl. 72-356.000.

National Standard Company: *See*—
Pond, Robert B., Sr.; Winter, John M., Jr.; and Tibbetts, Bruce S., 4,170,257, Cl. 164-87.000.

National Starch and Chemical Corporation: *See*—
Pastor, Stephen D.; and Grover, Martin M., 4,170,612, Cl. 525-101.000.

Naumann, Alfred W.: *See*—
Kurtz, Abraham N.; Cunningham, Robert W.; and Naumann, Alfred W., 4,170,572, Cl. 252-455.00R.

Neef, Gunter: *See*—
Weber, Alfred; Kennecke, Mario; Popper, Alfred; Muller, Rudolf; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Neef, Gunter; and Wiechert, Rudolf, 4,170,518, Cl. 435-55.000.

Nees, John M., to General Battery Corporation. Disposable battery packing for charged and dumped batteries. 4,170,692, Cl. 429-48.000.

Nelson, Arvid L., to Cooper Industries, Inc. Profile cutter. 4,170,164, Cl. 409-13.000.

Nelson, Byron G. Breathing apparatus. 4,170,230, Cl. 128-139.000.

Nelson, Frank: *See*—
Daughton, John W.; Gillett, Kenneth; Nelson, Frank; and Wilczek, Stephen P., 4,170,791, Cl. 364-900.000.

NGK Insulators, Ltd.: *See*—
Watanabe, Tetsuo; and Wada, Shigetaka, 4,170,530, Cl. 204-195.00S.
Watanabe, Tetsuo; Wada, Shigetaka; and Mase, Shunzo, 4,170,531, Cl. 204-195.00S.

Nickey, George A.: *See*—
Heckman, Russell W.; and Nickey, George A., 4,170,074, Cl. 34-57.00A.

Nielsen, Arnold T., to United States of America, Navy. Method for preparing the bispicrate salt of 2,3,7,8-tetraazaspiro[4.4]nonane. 4,170,706, Cl. 548-356.000.

Nielsen, Arnold T., to United States of America, Navy. Method for preparing 3,8-dicarbomethoxy-2,3,7,8-tetraazaspiro[4.4]nona-1,6-diene. 4,170,707, Cl. 548-356.000.

Nihon Electronic Industry Co., Ltd.: *See*—
Saito, Minoru; and Matsumoto, Yutaka, 4,170,155, Cl. 83-76.000.

Nikawitz, Edward J.: *See*—
Brandman, Harold A.; Freudewald, Joachim E.; Manowitz, Milton; Nikawitz, Edward J.; and Sharpell, Frederick H., Jr., 4,170,704, Cl. 546-290.000.

Nilsson, Sven F., to P-Form AB. Floor shuttering. 4,170,338, Cl. 249-31.000.

Nippon Oil Company Limited: *See*—
Itoh, Hiroyuki; Yamanashi, Teruaki; and Imai, Hirosuke, 4,170,583, Cl. 260-29.70H.

Nippon Paint Co., Ltd.: *See*—
Hirasawa, Youji; and Yamamoto, Hisataka, 4,170,671, Cl. 427-388.00C.

Nippon Telegraph and Telephone Public Corporation: *See*—
Katsui, Akinori; and Egashira, Kazumichi, 4,170,689, Cl. 428-457.000.

Nippondenso Co., Ltd.: *See*—
Takeuchi, Yukihisa; and Horie, Kouji, 4,170,200, Cl. 123-3.000.

Nishibe, Minoru: *See*—
Fujii, Sumihide; Fukinbara, Hazime; Mizutani, Katuzi; Nishibe, Minoru; and Ishii, Yoshitomo, 4,170,494, Cl. 148-12.00B.

Nishijima, Kunihiro, to Uchiyama Kogyo Kaisha, Ltd. Apparatus for forming seal liner in crown shell. 4,170,445, Cl. 425-126.00R.

Nissan Motor Company, Ltd.: *See*—
Matsuki, Masamitsu, 4,170,674, Cl. 428-90.000.
Nakajyo, Noriaki; and Uchiyama, Toshihiko, 4,170,524, Cl. 204-15.000.

Niwa, Kyohei: *See*—
Ooka, Isami; Sato, Tomohiro; and Niwa, Kyohei, 4,170,115, Cl. 62-52.000.

Nixdorf Computer AG: *See*—
Hoeink, Helmut; Jaeger, Waldemar; Scholich, Peter; Roeschlein, Rolf; and Podtschaske, Helmut, 4,170,348, Cl. 271-240.000.

Nolan, Ronald M. Combination tray and picture frame apparatus. 4,170,303, Cl. 206-557.000.

Nordstrom, Kjell H.; and Flinth, Rune N. A., to Flintab AB. Apparatus for weighing railway supported vehicles. 4,170,268, Cl. 177-163.000.

Norfleet, James: *See—*
Cordon, Martin; and Norfleet, James, 4,170,634, Cl. 424-49.000.

Norman, Maurice, to J. S. Mannor Machine Corporation. Environmental, small-part continuous washing process. 4,170,488, Cl. 134-10.000.

Norris, Alan H.; and Chambley, Phillip W., to WWG Industries, Inc. Node fixation in self-twist yarn. 4,170,103, Cl. 57-293.000.

Notz, Hans, to BBC Brown, Boveri & Company Limited. High-current, low pressure, mercury discharge lamp with pressure compensation space. 4,170,743, Cl. 313-204.000.

Nouvertne, Werner: *See—*
Schmidt, Manfred; Freitag, Dieter; and Nouvertne, Werner, 4,170,587, Cl. 260-37.0PC.

Novais, Guillermo B.: *See—*
Moreno, Miguel A. P.; Cil, Jorge A.; Montero, Justo B.; Novais, Guillermo B.; Morales, Jose A. R.; Montalvo, Fernando C.; Rivero, Armando A.; Castro, Mario J. M.; and Suarez, Jacinto F., 4,170,098, Cl. 56-13.900.

Novak, Robert M.: *See—*
Hall, John B.; Wiegers, Wilhelmus J.; Hill, Ira D.; Novak, Robert M.; and Schmitt, Frederick L., 4,170,576, Cl. 252-522.000.

NRM Corporation: *See—*
Singh, Anand P., 4,170,442, Cl. 425-38.000.

Nuding, Werner: *See—*
Roentgen, Paul; Simons, Hubert; and Nuding, Werner, 4,170,688, Cl. 428-433.000.

Oak, George A.: *See—*
Mocek, Aloysius M., Jr.; and Oak, George A., 4,170,393, Cl. 339-63.00M.

Oguchi, Yukio: *See—*
Kaito, Hiroyuki; Ohtani, Takashi; Iwaoka, Shoji; Oguchi, Yukio; Yano, Shuya; and Ejima, Akio, 4,170,467, Cl. 75-49.000.

Ohkuma, Hideo: *See—*
Ichinose, Noboru; Ohkuma, Hideo; Takahashi, Takashi; and Takei, Masayoshi, 4,170,770, Cl. 340-634.000.

Ohsawa, Mitsuo, to Sony Corporation. Apparatus for adjusting the position of an arm in a record playing device, such as a phonograph or the like. 4,170,360, Cl. 274-23.00R.

Ohtani, Takashi: *See—*
Kaito, Hiroyuki; Ohtani, Takashi; Iwaoka, Shoji; Oguchi, Yukio; Yano, Shuya; and Ejima, Akio, 4,170,467, Cl. 75-49.000.

Oil Base, Inc.: *See—*
Bennett, Robert B.; McMordie, Warren C., Jr.; and Taylor, William H., 4,170,248, Cl. 138-97.000.

Oka, Kozo: *See—*
Sadamatsu, Shigeru; and Oka, Kozo, 4,170,476, Cl. 96-1.50N.

Okada, Ichiro. Method for marking fabric with erasable color marking composition. 4,170,669, Cl. 427-275.000.

O'Keefe, George F.; Roy, Donald A.; and Byam, Erwin B., to Textron Inc. Hydraulic and mechanical punch holder adjustment. 4,170,051, Cl. 10-12.500.

Okerblom, Charles L. Holding clip. 4,170,052, Cl. 24-67.900.

Okuda, Hiroji, to Koyo Seiko Company Limited. Method of working outer periphery of articles with laser light. 4,170,726, Cl. 219-121.0LM.

Olesker, Alain: *See—*
Gero, Stephan; Mercier, Daniel; Olesker, Alain; and Cier, Andre, 4,170,643, Cl. 424-181.000.

Olsen, Dennis R.; and Spanjer, Keith G., to Motorola, Inc. Solder system. 4,170,472, Cl. 75-175.00A.

Olsen, Dick M.: *See—*
Gniewek, Stephen A.; and Olsen, Dick M., 4,170,131, Cl. 73-116.000.

Olson, B. Newell, to Dominion Pharmacal, Inc. Method for improved health care of hair and scalp using a vitamin A aqueous emulsion. 4,170,229, Cl. 128-67.000.

Olson, Daniel H.; Hunsicker, Larry R.; and Johnson, Stanley A., to Merit Plastics, Inc. Operating unit for controls. 4,170,151, Cl. 74-501.00R.

Olympus Optical Co., Ltd.: *See—*
Nakagawa, Jihei, 4,170,402, Cl. 350-184.000.
Satoh, Ken; and Tomizawa, Yoshio, 4,170,790, Cl. 364-705.000.

O'Neal, Thomas D., to American Cyanamid Company. Method for controlling the relative stem growth of plants. 4,170,462, Cl. 71-76.000.

Onizuka, Shigenori: *See—*
Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, 4,170,574, Cl. 252-472.000.

Ooka, Isami; Sato, Tomohiro; and Niwa, Kyohei, to Osaka Gas Company, Limited. Apparatus and process for vaporizing liquefied natural gas. 4,170,115, Cl. 62-52.000.

Opsasnick, John P.: *See—*
Miller, William A.; Opsasnick, John P.; and Miller, William A., 4,170,686, Cl. 428-416.000.

O+R Inktchemie N.V.: *See—*
Schelhaas, Ealbertus W., 4,170,578, Cl. 260-17.200.

Orlando, Charles M.; and Lavallee, Francois A., to General Electric Company. Brominated biphenol derivatives. 4,170,711, Cl. 568-610.000.

Osaka Gas Company, Limited: *See—*
Ooka, Isami; Sato, Tomohiro; and Niwa, Kyohei, 4,170,115, Cl. 62-52.000.

Oswald, Alexis A.: *See—*
Daniher, Francis A.; and Oswald, Alexis A., 4,170,608, Cl. 260-556.00N.

Oury, Robert F., to Rotec Industries. Articulate conveyor system for tower crane. 4,170,291, Cl. 198-588.000.

Overath, Horst: *See—*
Lang, Helmut; Overath, Horst; and Priester, Heinz-Werner, 4,170,553, Cl. 210-49.000.

Owades, Joseph L., to S. S. Steiner, Inc. Method for producing a deodorant. 4,170,638, Cl. 424-65.000.

Owen, Ronald P.; Miller, George A.; and Schneider, Charles M., to Rohm and Haas Company. Phosphonothioureide anthelmintics. 4,170,648, Cl. 424-200.000.

Owens, Boyd L. Power mower edger and trimmer attachment. 4,170,099, Cl. 56-16.900.

Owens-Corning Fiberglas Corporation: *See—*
Myers, John E., 4,170,459, Cl. 65-3.00R.

Owens-Illinois, Inc.: *See—*
Heckman, Russell W.; and Nickey, George A., 4,170,074, Cl. 34-57.00A.
Uhlig, Albert R., 4,170,622, Cl. 264-520.000.

Owens, William M., to Micro Peripherals, Inc. Mechanism for transforming rotary motion to linear motion adapted for driving a magnetic head. 4,170,146, Cl. 74-89.200.

Oxy Metal Industries Corporation: *See—*
Creutz, Hans G., deceased; and Herr, Roy W., 4,170,526, Cl. 204-55.00R.

Oyama, Shigeaki: *See—*
Hashimoto, Yoshihiro; Oyama, Shigeaki; and Araki, Hiroshi, 4,170,276, Cl. 192-48.910.

Ozawa, Hirosi: *See—*
Mori, Kaoru; Tanaka, Hiro; Ozawa, Hirosi; and Murakami, Yoichi, 4,170,582, Cl. 260-29.6RW.

Ozbey, Ahmet M.; and Ozbey, Amber L. Spring-type arm and leg exerciser. 4,170,351, Cl. 272-134.000.

Ozbey, Amber L.: *See—*
Ozbey, Ahmet M.; and Ozbey, Amber L., 4,170,351, Cl. 272-134.000.

P-Form AB: *See—*
Nilsson, Sven F., 4,170,338, Cl. 249-31.000.

Pace Incorporated: *See—*
Milne, James A., 4,170,511, Cl. 156-498.000.

Packaging Corporation of America: *See—*
Johnson, Charles H., 4,170,297, Cl. 206-326.000.

Pagani, Giorgio, to Snamprogetti, S.p.A. Apparatus for the desalination of sea water, with automatic regulation of the fresh and salt water levels. 4,170,514, Cl. 159-18.000.

Pai, Rong-Chang: *See—*
Liu, Daniel T. H.; Irwin, John F.; and Pai, Rong-Chang, 4,170,639, Cl. 424-101.000.

Pall Corporation: *See—*
Pall, David B., 4,170,556, Cl. 210-181.000.

Pall, David B., to Pall Corporation. Filter elements and filter assemblies with thermal seal. 4,170,556, Cl. 210-181.000.

Pan, Peter N. Y.: *See—*
Weierman, Robert J.; Merle, Joseph J.; Gordon, Gerald A.; Pan, Peter N. Y.; and Hernandez, Rafael J., 4,170,314, Cl. 220-260.000.

Pancholy, Ranjeet K.; Kuhlmann, Gordon J.; and Phillips, D. Howard, to Rockwell International Corporation. Method for reducing surface recombination velocities in III-V compound semiconductors. 4,170,666, Cl. 427-82.000.

Pappas, Michael; Witte, Paul A.; and Severud, Christopher N., Jr., to Falcon Safety Products, Inc. Sensor element and assembly for thermally responsive apparatus. 4,170,189, Cl. 116-106.000.

Pardes, Herman I. Moving target screen with modulating grid. 4,170,077, Cl. 35-25.000.

Parker-Hannifin Corporation: *See—*
Jenkins, Kenneth E., 4,170,168, Cl. 91-522.000.
Schwarz, Maurice L., 4,170,280, Cl. 188-352.000.

Parker, Norman W.: *See—*
Hilbert, Francis H.; and Parker, Norman W., 4,170,716, Cl. 179-1.0GS.

Pastor, Stephen D.; and Grover, Martin M., to National Starch and Chemical Corporation. Pressure sensitive adhesive compositions. 4,170,612, Cl. 525-101.000.

Paulson, Jerome T.: *See—*
Buschbom, Floyd E.; Hansen, Glen D.; and Paulson, Jerome T., 4,170,385, Cl. 406-59.000.

Pawlowski, Thomas D.; and Meyers, George L., to American Can Company. Receptacle. 4,170,325, Cl. 229-17.00B.

Payne, William J., to Modulus Corporation. Visual indicator. 4,170,163, Cl. 85-62.000.

Pedersen, Harry: *See—*
Ellwanger, Charles G.; and Pedersen, Harry, 4,170,091, Cl. 51-5.00D.

Pelletier, Claude, to Societe Anonyme Potain Pioclain Materiel (P.P.M.). Fluid flow control devices. 4,170,279, Cl. 188-300.000.

Perkin-Elmer Corporation, The: *See—*
Fencil, Carroll R., 4,170,416, Cl. 356-346.000.
Yoder, Paul R., Jr.; Schlesinger, Eugene R.; and Crane, Robert, Jr., 4,170,401, Cl. 350-173.000.

Perkins, Charles M. Internal combustion engine. 4,170,202, Cl. 123-75.00B.

Pernyeszi, Joseph, to International Telephone and Telegraph Corporation. High voltage switch and capacitive drive. 4,170,740, Cl. 307-251.000.

Perronnet, Jacques; and Girault, Pierre, to Roussel UCLAF. Novel crotonamides. 4,170,465, Cl. 71-118.000.

Peterson, Gary J. Variable flow funnel construction. 4,170,252, Cl. 141-331.000.

Petraki, Lawrence T.: *See—*
Criglar, John J.; and Petraki, Lawrence T., 4,170,225, Cl. 128-733.000.

Petrie, Adelore F.; and Javeri, Rupin J., to Motorola, Inc. Ignition dwell circuit for an internal combustion engine. 4,170,209, Cl. 123-148.00E.

Phelps, Frank R.: *See—*
Booman, Glenn L.; and Phelps, Frank R., 4,170,135, Cl. 73-290.00R.

Phillips, D. Howard: *See—*
Pancholy, Ranjeet K.; Kuhlmann, Gordon J.; and Phillips, D. Howard, 4,170,666, Cl. 427-82.000.

Pia, Louis J. Mushroom farming apparatus and method. 4,170,432, Cl. 414-269.000.

Piche, Fernand J., to Fernand Piche Enterprises Limited. Recovery of tungsten carbide from scrap mining bits. 4,170,513, Cl. 156-656.000.

Pick, Ernest W., to Purdue Frederick Company, The. Dressing change kits. 4,170,300, Cl. 206-365.000.

Pico Electronics Limited: *See—*
Leech, Leslie A.; and Riddoch, Henry J., 4,170,359, Cl. 274-10.00R.

Pilch, Raymond C.: *See—*
Howell, Melvyn J.; and Pilch, Raymond C., 4,170,731, Cl. 250-227.000.

Pillsbury Company, The: *See—*
Totino, Rose W.; Behnke, James R.; Westover, Jack D.; and Keller, Richard L., 4,170,659, Cl. 426-95.000.

Pinter, Merrill E.: *See—*
Kress, Edward S.; LaBerdia, William L.; Medley, Jackson C.; and Pinter, Merrill E., 4,170,434, Cl. 414-459.000.

Pioneer Electronic Corporation: *See—*
Hashimoto, Komei; Komatsubara, Masahiro; Yasuda, Shinji; Masumoto, Yutaka; and Satoh, Kazuhiko, 4,170,788, Cl. 360-129.000.
Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, 4,170,742, Cl. 310-324.000.

Pipersky, Emil: *See—*
Fritz, Brian E.; and Pipersky, Emil, 4,170,088, Cl. 47-47.000.

Pitney-Bowes: *See—*
Chen, Yew-Tsung, 4,170,474, Cl. 75-251.000.

Pitney-Bowes, Inc.: *See—*
Conti, Joseph A., 4,170,350, Cl. 271-274.000.
Sette, Paul R.; and Storace, Anthony, 4,170,270, Cl. 177-184.000.

Piusz, Peter G.: *See—*
Chu, Nori Y. C.; and Piusz, Peter G., 4,170,567, Cl. 252-300.000.

Piwonka, Thomas S.: *See—*
Blazek, William S.; Piwonka, Thomas S.; Jackson, James D.; and Atanmo, Philip N., 4,170,256, Cl. 164-26.000.

Platt Saco Lowell Limited: *See—*
Whiteley, John, 4,170,102, Cl. 57-58.890.

Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Greiner, Henri; and LeFaucheur, Claude, 4,170,255, Cl. 152-361.0FP.

Podtschaske, Helmut: *See—*
Hoeink, Helmut; Jaeger, Waldemar; Scholich, Peter; Roeschlein, Rolf; and Podtschaske, Helmut, 4,170,348, Cl. 271-240.000.

Polaroid Corporation: *See—*
Stella, Joseph A., 4,170,407, Cl. 352-72.000.

Pond, Robert B., Sr.; Winter, John M., Jr.; and Tibbetts, Bruce S., to National Standard Company. Method and apparatus for producing filamentary articles by melt extraction. 4,170,257, Cl. 164-87.000.

Popper, Alfred: *See—*
Weber, Alfred; Kennecke, Mario; Popper, Alfred; Muller, Rudolf; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Neef, Gunter; and Wiechert, Rudolf, 4,170,518, Cl. 435-55.000.

Porten, Ronald M.: *See—*
Meyst, Richard P.; and Porten, Ronald M., 4,170,056, Cl. 29-163.50F.

Posakony, Gerald J.; Hildebrand, B. Percy; and Davis, Thomas J., to Electric Power Research Institute, Inc. Linear transducer array and method for both pulse-echo and holographic acoustic imaging. 4,170,142, Cl. 73-603.000.

Potomac Applied Mechanics, Inc.: *See—*
Spevak, Stephen T., 4,170,392, Cl. 312-283.000.
Stubbings, James H., 4,170,324, Cl. 224-279.000.

Power Industries Inc., Division of Groman Corporation: *See—*
Mocek, Aloysius M., Jr.; and Oak, George A., 4,170,393, Cl. 339-63.00M.

PPG Industries, Inc.: *See—*
Bosso, Joseph F.; and Wismer, Marco, 4,170,579, Cl. 260-29.2TN.
Breininger, J. Shannon; and Greenberg, Charles B., 4,170,461, Cl. 65-60.00D.
Crano, John C., 4,170,614, Cl. 260-983.000.
Donley, Harold E., 4,170,460, Cl. 65-30.00R.
Hahn, Ernest A.; Murphy, Gary F., deceased; and Bruckbauer, Gerald J., 4,170,663, Cl. 427-44.000.
Simmons, Robert B., 4,170,537, Cl. 204-295.000.
Simmons, Robert B., 4,170,538, Cl. 204-295.000.
Simmons, Robert B., 4,170,539, Cl. 204-295.000.

Preibinger, Karl-Heinz: *See—*
Behn, Reinhard; Lauber, Josef; Preibinger, Karl-Heinz; and Rheindorf, Hans-Heinz, 4,170,665, Cl. 427-79.000.

Preisler, James M.: *See—*
Rudd, Thomas H.; and Preisler, James M., 4,170,260, Cl. 165-51.000.

Pridham, Roger G.; Callahan, Andrew C.; and Mucci, Ronald A., to Raytheon Company. Beamformer. 4,170,766, Cl. 367-135.000.

Priester, Heinz-Werner: *See—*
Lang, Helmut; Overath, Horst; and Priester, Heinz-Werner, 4,170,553, Cl. 210-49.000.

Procter & Gamble Company, The: *See—*
Flesher, Daniel J.; and Kingry, Gary W., 4,170,565, Cl. 252-93.000.
Kitko, David J., 4,170,453, Cl. 8-111.000.

Proctor & Schwartz, Inc.: *See—*
Hine, Edwin W., II, 4,170,251, Cl. 141-11.000.
Scott, John F., 4,170,075, Cl. 34-160.000.

Prostyakov, Alexandr A.: *See—*
Butseniex, Imant E.; Levina, Margarita Y.; Prostyakov, Alexandr A.; Stolov, Mikhail Y.; Sharamkin, Vladimir I.; and Scherbinin, Eduard V., 4,170,713, Cl. 13-29.000.

Pruett, Robert L. Recirculating submersible turbine. 4,170,114, Cl. 60-496.000.

Przemyslowy Instytut Automatyki i Pomiarow "MERA-PIAP: *See—*
Michalski, Stanislaw; and Fabrycy, Marian, 4,170,753, Cl. 324-384.000.

Pugsley, Thomas A.: *See—*
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,170,653, Cl. 424-267.000.

Pum, Franz J., to Redken Laboratories, Inc. Frosting bleach composition. 4,170,637, Cl. 424-62.000.

Purdue Frederick Company, The: *See—*
Pick, Ernest W., 4,170,300, Cl. 206-365.000.

Q Corporation: *See—*
Smith, E. Quimby, 4,170,738, Cl. 290-42.000.

Quaye, Mesa: *See—*
Ries, Karl; Kaiser, Dieter; Quaye, Mesa; Boms, Heinz-Jurgen; and Jannsen, Klaus-Uwe, 4,170,143, Cl. 73-609.000.

Raboud, Norbert: *See—*
Fresard, Marcel; and Raboud, Norbert, 4,170,184, Cl. 112-317.000.

Radecki, Dan J.; and Chadwick, Curt H., to GTE Sylvania Incorporated. Conductively cooled laser pumping assembly. 4,170,763, Cl. 331-94.50D.

Radin, Edward. Combustion process. 4,170,110, Cl. 60-204.000.

Rahnke, Christian J.: *See—*
Rao, V. Durga Nageswar; Rahnke, Christian J.; Fucinari, Carlo A.; and Vallance, James K., 4,170,620, Cl. 264-230.000.

Raitport, Eli. Energy absorbing devices to be used on vehicles to protect the vehicle from damage (or reduce damage) and protect the passengers from fatality and/or injury. 4,170,380, Cl. 296-65.00A.

Rampart, Guido: *See—*
Danziger, Harry; Kaiser, Bernd-Ulrich; Rampart, Guido; and Schroter, Jurgen, 4,170,592, Cl. 260-239.30A.

Randall, Russel R., to Dresser Industries, Inc. Pulsed neutron porosity logging method and apparatus using dual detectors. 4,170,732, Cl. 250-264.000.

Rao, Bangaru V. N.: *See—*
Thomas, Gareth; and Rao, Bangaru V. N., 4,170,497, Cl. 148-36.000.
Thomas, Gareth; and Rao, Bangaru V. N., 4,170,499, Cl. 148-143.000.

Rao, V. Durga Nageswar; Rahnke, Christian J.; Fucinari, Carlo A.; and Vallance, James K., to Ford Motor Company. Process for making and assembling a rotary regenerator and drive gear construction. 4,170,620, Cl. 264-230.000.

Raychem Corporation: *See—*
Wetmore, Judson D., 4,170,296, Cl. 206-219.000.

Raytheon Company: *See—*
Pridham, Roger G.; Callahan, Andrew C.; and Mucci, Ronald A., 4,170,766, Cl. 367-135.000.

RCA Corporation: *See—*
Bowman, David F., 4,170,778, Cl. 343-771.000.
Jebens, Robert W., 4,170,616, Cl. 264-1.000.
Khajezadeh, Heshmat, 4,170,501, Cl. 148-175.000.

Redken Laboratories, Inc.: *See—*
Pum, Franz J., 4,170,637, Cl. 424-62.000.

Reed, John H. Air motor with expansible chamber. 4,170,166, Cl. 91-481.000.

Reenstra, Arthur L.: *See—*
Jost, Ernest M.; Reenstra, Arthur L.; and Trenkler, George, 4,170,498, Cl. 148-121.000.

Rees, Richard W.: *See—*
Kao, Wenling; and Rees, Richard W., 4,170,709, Cl. 560-121.000.

Regitz, Lester J., to United States Steel Corporation. Deoxidation of steel. 4,170,468, Cl. 75-58.000.

Regor Energy Saver Inc.: *See—*
Minor, Robert N.; and Metivier, Roger M., 4,170,199, Cl. 122-33.000.

Reliance Electric Co.: *See—*
Leffler, James M., 4,170,058, Cl. 29-596.000.

Rembaum, Alan; Gupta, Amitava; and Volksen, Willi, to California Institute of Technology. Polyvinyl pyridine microspheres. 4,170,685, Cl. 428-402.000.

Remberg, Axel; and Triesch, Willi, to Kraftwerk Union Aktiengesellschaft. Shaft sealing system for a steam turbine. 4,170,364, Cl. 277-53.000.

Rennie, George K.: *See—*
Edwards, John R.; Rennie, George K.; Rosser, David A.; and Smart, Colin, 4,170,681, Cl. 428-205.000.

Rheindorf, Hans-Heinz: *See*—
Behn, Reinhard; Lauber, Josef; Preibinger, Karl-Heinz; and Rheindorf, Hans-Heinz, 4,170,665, Cl. 427-79.000.
Rich, Leonard G.; and Berdat, Henry F., to Gerber Scientific Instrument Company, The. Lamp flashing circuit for line generating photoexposure device. 4,170,745, Cl. 315-241.00R.
Richter, Simon J., to Coca-Cola Company, The. Pressure relief valve for product containers. 4,170,243, Cl. 137-240.000.
Rickenbacher, Thomas. Sliding base. 4,170,367, Cl. 280-18.000.
Riddoch, Henry J.: *See*—
Leech, Leslie A.; and Riddoch, Henry J., 4,170,359, Cl. 274-10.00R.
Ridge, David N.: *See*—
Hanifin, John W., Jr.; and Ridge, David N., 4,170,656, Cl. 424-304.000.
Ridgley, William A. Thermometer and integral joint. 4,170,137, Cl. 73-343.00R.
Ries, Karl; Kaiser, Dieter; Quaye, Mesa; Boms, Heinz-Jurgen; and Jannsen, Klaus-Uwe, to Mannesmann Aktiengesellschaft. Recognizing ultrasonic response signals during testing of structural materials. 4,170,143, Cl. 73-609.000.
Riggers Manufacturing Company: *See*—
Lampson, Neil F., 4,170,309, Cl. 212-48.000.
Riggs, Robert S., to Goodyear Tire & Rubber Company, The. Tire building accessory. 4,170,504, Cl. 156-123.00R.
Rigterink, Raymond H., to Dow Chemical Company, The. Substituted(((phenyl)amino)carbonyl)-benzamides. 4,170,657, Cl. 424-322.000.
Ritscher, James S., to Union Carbide Corporation. Novel combustion catalyst. 4,170,571, Cl. 252-455.00Z.
Rivero, Armando A.: *See*—
Moreno, Miguel A. P.; Cil, Jorge A.; Montero, Justo B.; Novais, Guillermo B.; Morales, Jose A. R.; Montalvo, Fernando C.; Rivero, Armando A.; Castro, Mario J. M.; and Suarez, Jacinto F., 4,170,098, Cl. 56-13.900.
Robert Bosch GmbH: *See*—
Gunschmann, Peter; Rossmann, Heinrich; Wolf, Theo; and Gause, Dieter, 4,170,787, Cl. 360-95.000.
Stumpe, Werner, 4,170,387, Cl. 303-22.00R.
Roberts, George L.: *See*—
Blake, David W.; Sheehan, Gerard M.; Rowland, John D.; and Roberts, George L., 4,170,485, Cl. 106-300.000.
Robertson, George H.; Rooney, Robert L.; and Todd, Robert B., to Ciba-Geigy Corporation. Process for granulating pigment compositions. 4,170,487, Cl. 106-309.000.
Robinson, Lawrence W.: *See*—
Fitzsimmons, George W.; Robinson, Lawrence W.; and Takeuchi, Jim S., 4,170,773, Cl. 343-6.50R.
Rockwell International Corporation: *See*—
Bailey, Robert F., 4,170,471, Cl. 75-173.00C.
Henrie, James O., 4,170,455, Cl. 23-232.00R.
Pancholy, Ranjeet K.; Kuhlmann, Gordon J.; and Phillips, D. Howard, 4,170,666, Cl. 427-82.000.
Roddy, Joseph T.; and Butler, William R., to Emerson Electric Co. Method of making a dynamoelectric machine. 4,170,057, Cl. 29-596.000.
Rodgers, Michael A., to Motorola, Inc. Process for manufacturing pure polycrystalline silicon. 4,170,667, Cl. 427-86.000.
Rodgers, William C.: *See*—
King, Harold L., 4,170,335, Cl. 248-246.000.
Roentgen, Paul; Simons, Hubert; and Nuding, Werner, to Saint-Gobain Industries. Process for bonding an improved metallic support member to glass surfaces. 4,170,688, Cl. 428-433.000.
Roeschlein, Rolf: *See*—
Hoeink, Helmut; Jaeger, Waldemar; Scholich, Peter; Roeschlein, Rolf; and Podtschaske, Helmut, 4,170,348, Cl. 271-240.000.
Rogers, G. William: *See*—
Elson, Edward E.; Burke, Ernest L.; and Rogers, G. William, 4,170,228, Cl. 128-725.000.
Rogers, John W. Steel metal web handling method, apparatus, and coil construct. 4,170,691, Cl. 428-572.000.
Rogers, Richard E., to Koehring Company. Hydraulic function disconnect means. 4,170,308, Cl. 212-29.0DB.
Rohm GmbH: *See*—
Helm, Herbert; Kundinger, Kurt; and Schanz, Karl-Heinz, 4,170,094, Cl. 52-821.000.
Rohm and Haas Company: *See*—
Armbruster, David C.; and Fischer, William F., 4,170,690, Cl. 428-447.000.
Owen, Ronald P.; Miller, George A.; and Schneider, Charles M., 4,170,648, Cl. 424-200.000.
Rollei-Werke Franke & Heidecke: *See*—
Sobotta, Reinhard; and Mankau, Dieter, 4,170,409, Cl. 353-119.000.
Rolls-Royce Limited: *See*—
Mobsby, John A., 4,170,108, Cl. 60-39.74R.
Rombrecht, Hans-Malte: *See*—
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, 4,170,684, Cl. 428-379.000.
Rombusch, Konrad: *See*—
Hegenberg, Peter, deceased; Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helmut; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, 4,170,588, Cl. 260-45.80N.
Rooney, Robert L.: *See*—
Robertson, George H.; Rooney, Robert L.; and Todd, Robert B., 4,170,487, Cl. 106-309.000.
Rosemount Inc.: *See*—
Serley, James E., 4,170,132, Cl. 73-178.00T.
Rosenzweig, Philip. Drapery pleater hook. 4,170,053, Cl. 24-84.00R.
Rosser, David A.: *See*—
Edwards, John R.; Rennie, George K.; Rosser, David A.; and Smart, Colin, 4,170,681, Cl. 428-205.000.
Rossmann, Heinrich: *See*—
Gunschmann, Peter; Rossmann, Heinrich; Wolf, Theo; and Gause, Dieter, 4,170,787, Cl. 360-95.000.
Rossnagel, Sigrid, heir: *See*—
Hegenberg, Peter, deceased; Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helmut; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, 4,170,588, Cl. 260-45.80N.
Rotec Industries: *See*—
Oury, Robert F., 4,170,291, Cl. 198-588.000.
Rotheiser, Jordan I., to American Wheel & Engineering Co., Inc. Molded wheel having a decorative sidewall. 4,170,384, Cl. 301-63.0PW.
Rothenberg, Sidney; and Vostovich, Joseph E., to General Electric Company. Compound for patching voids in a semi-conductive component of insulated electric cable. 4,170,575, Cl. 252-511.000.
Rothrock, Michael E.: *See*—
Austin, James W.; Morris, Oscar L.; and Rothrock, Michael E., 4,170,765, Cl. 367-100.000.
Rotopark S.A.: *See*—
Bajulaz, Roger, 4,170,310, Cl. 414-241.000.
Rottmaier, Ludwig; and Merten, Rudolf, to Bayer Aktiengesellschaft. Process for the preparation of (thio)hydantoins modified with amide groups. 4,170,701, Cl. 528-49.000.
Roubertie, Patrice: *See*—
Meriadec, Brigette; and Roubertie, Patrice, 4,170,454, Cl. 23-230.600.
Roussel UCLAF: *See*—
Perronnet, Jacques; and Girault, Pierre, 4,170,465, Cl. 71-118.000.
Rowland, John D.: *See*—
Blake, David W.; Sheehan, Gerard M.; Rowland, John D.; and Roberts, George L., 4,170,485, Cl. 106-300.000.
Roy, Donald A.: *See*—
O'Keefe, George F.; Roy, Donald A.; and Byam, Erwin B., 4,170,051, Cl. 10-12.500.
Rudd, Thomas H.; and Preisler, James M., to Drag Specialties, Inc. Exhaust pipe cooling clamp for motorcycles. 4,170,260, Cl. 165-51.000.
Rudin, Melvin: *See*—
Fleming, James H.; and Rudin, Melvin, 4,170,444, Cl. 425-123.000.
Rudzena, William L.: *See*—
Garrett, Scott T.; Rudzena, William L.; and Jess, Thurman S., 4,170,224, Cl. 128-748.000.
Ruffner, Arno; and Siegfried, Roland. Casket. 4,170,054, Cl. 27-4.000.
Russell, David A.: *See*—
Hertzberg, Abraham; and Russell, David A., 4,170,330, Cl. 244-3.130.
Ruth, Ralph G., to Dresser Engineering Company. Energy efficient distillation process. 4,170,548, Cl. 208-351.000.
S. S. Steiner, Inc.: *See*—
Owades, Joseph L., 4,170,638, Cl. 424-65.000.
S.W.F. Machinery, Inc.: *See*—
Hightower, James R., 4,170,095, Cl. 53-75.000.
Sadamatsu, Shigeru; and Oka, Kozo, to Fuji Xerox Co., Ltd. Layered photoconductive element having As and/or Te doped with Ga, In or Tl intermediate to Se and insulator. 4,170,476, Cl. 96-1.50N.
Saeki, Noriyoshi; and Nakamura, Kiyoko, to Saeki, Noriyoshi. Fixed volume discharge device. 4,170,318, Cl. 222-455.000.
Saint-Gobain Industries: *See*—
Roentgen, Paul; Simons, Hubert; and Nuding, Werner, 4,170,688, Cl. 428-433.000.
Saito, Minoru; and Matsumoto, Yutaka, to Nihon Electronic Industry Co., Ltd. Rotary cutter for successively cutting moving material to lengths. 4,170,155, Cl. 83-76.000.
Sakai, Kuniyuki: *See*—
Akama, Tadashi; and Sakai, Kuniyuki, 4,170,481, Cl. 96-115.00P.
Sakai, Nobuo: *See*—
Ikenoue, Shinpei; Masuda, Takao; Katsuyama, Harumi; Sekikawa, Nobuyoshi; Shishido, Tadao; and Sakai, Nobuo, 4,170,480, Cl. 96-114.100.
Salomon, Georges P. J., to S.A. des Etablissements Francois Salmon & Fils. Devices mounted on a ski. 4,170,372, Cl. 280-626.000.
Salz, Jack; and Werner, Jean J., to Bell Telephone Laboratories, Incorporated. Amplitude and frequency modulation system. 4,170,764, Cl. 332-17.000.
Sanders, Weldon A., Jr.: *See*—
Van Tyne, Richard G.; Sanders, Weldon A., Jr.; De La Matyr, Richard D.; and Gates, David L., 4,170,419, Cl. 356-431.000.
Sandoz, Inc.: *See*—
Bennett, Gregory B., 4,170,599, Cl. 260-345.200.
Nadelson, Jeffrey, 4,170,705, Cl. 546-296.000.
Sandoz Ltd.: *See*—
Baumann, Werner, 4,170,600, Cl. 260-380.000.

Santilli, Domenic: *See*—
Merrill, Stewart H.; and Santilli, Domenic, 4,170,563, Cl. 252-62.10L.
Sasse, Wolfgang H. F.: *See*—
Grigg, Geoffrey W.; and Sasse, Wolfgang H. F., 4,170,640, Cl. 424-177.000.
Sato, Tomohiro: *See*—
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Satoh, Kazuhiko: *See*—
Hashimoto, Komei; Komatsubara, Masahiro; Yasuda, Shinji; Masumoto, Yutaka; and Satoh, Kazuhiko, 4,170,788, Cl. 360-129.000.
Satoh, Ken; and Tomizawa, Yoshio, to Olympus Optical Co., Ltd. Tape recorder device with tape running speed display. 4,170,790, Cl. 364-705.000.
Sauer, Gerhard: *See*—
Weber, Alfred; Kennecke, Mario; Popper, Alfred; Muller, Rudolf; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Neef, Gunter; and Wiechert, Rudolf, 4,170,518, Cl. 435-55.000.
Schaefer, Carl F., to United Technologies Corporation. Amplitude selected phase interferometer angle measuring radar. 4,170,774, Cl. 343-16.00M.
Schaefer, Cyril L. Auxiliary wheels for golf cart. 4,170,370, Cl. 280-400.000.
Schafer, Ian B. Method for treatment of oxidized metal surfaces. 4,170,493, Cl. 148-6.14R.
Schanz, Karl-Heinz: *See*—
Helm, Herbert; Kundinger, Kurt; and Schanz, Karl-Heinz, 4,170,094, Cl. 52-821.000.
Schelhaas, Ealbertus W., to O+R Inktchemie N.V. Aqueous rapid-drying printing ink. 4,170,578, Cl. 260-17.200.
Schell, Francis J.: *See*—
Baumann, Gerald W.; Gambrell, Joseph L.; Hayes, George F.; Schell, Francis J.; and Schulte, Allen G., 4,170,349, Cl. 271-296.000.
Scherbinin, Eduard V.: *See*—
Butseniex, Imant E.; Levina, Margarita Y.; Prostyakov, Alexandr A.; Stolov, Mikhail Y.; Sharamkin, Vladimir I.; and Scherbinin, Eduard V., 4,170,713, Cl. 13-29.000.
Schering Aktiengesellschaft: *See*—
Weber, Alfred; Kennecke, Mario; Popper, Alfred; Muller, Rudolf; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Neef, Gunter; and Wiechert, Rudolf, 4,170,518, Cl. 435-55.000.
Scheuermann, Fanny: *See*—
Zeidler, Ulrich; and Scheuermann, Fanny, 4,170,655, Cl. 424-284.000.
Schirtzinger, Joseph F., to Sea-Log Corporation. Arctic drilling and production platform. 4,170,187, Cl. 114-264.000.
Schlesinger, Eugene R.: *See*—
Yoder, Paul R., Jr.; Schlesinger, Eugene R.; and Crane, Robert, Jr., 4,170,401, Cl. 350-173.000.
Schmidt, Dwight C.: *See*—
Jones, Ancil A.; and Schmidt, Dwight C., 4,170,301, Cl. 206-423.000.
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, to Dr. Beck & Co. A.G. Conductors having insulation of polyester imide resin. 4,170,684, Cl. 428-379.000.
Schmidt, Ludwig: *See*—
Meye, Wolfgang; and Schmidt, Ludwig, 4,170,404, Cl. 350-252.000.
Schmidt, Manfred; Freitag, Dieter; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Statistical mixtures of halogenated bisphenols with halogen-free bisphenols, a process for their preparation and their use for the preparation of high-molecular weight thermoplastic polycarbonates. 4,170,587, Cl. 260-37.0PC.
Schmieder, Christian: *See*—
Seidel, Gunther; and Schmieder, Christian, 4,170,060, Cl. 30-43.920.
Schmitt, Frederick L.: *See*—
Hall, John B.; Wiegers, Wilhelmus J.; Hill, Ira D.; Novak, Robert M.; and Schmitt, Frederick L., 4,170,576, Cl. 252-522.000.
Kamath, Venkatesh; Mookherjee, Braja D.; and Schmitt, Frederick L., 4,170,577, Cl. 252-522.000.
Schmitz, Johannes J.; and Heinrich, Theodore M., to Westinghouse Electric Corp. Phase encoded digital position probe assembly. 4,170,754, Cl. 324-208.000.
Schneider, Charles M.: *See*—
Owen, Ronald P.; Miller, George A.; and Schneider, Charles M., 4,170,648, Cl. 424-200.000.
Scholes, Addison B.; Dollar, David L.; and Hurst, Robert L., to Ball Corporation. Apparatus for applying lubricating materials to metallic substrates. 4,170,193, Cl. 118-627.000.
Scholich, Peter: *See*—
Hoeink, Helmut; Jaeger, Waldemar; Scholich, Peter; Roeschlein, Rolf; and Podtschaske, Helmut, 4,170,348, Cl. 271-240.000.
Schon, Klaus-Peter, to Hoechst Aktiengesellschaft. Developing apparatus for developing latent electrostatic images. 4,170,195, Cl. 118-658.000.
Schonrogge, Burkhard: *See*—
Wortmann, Joachim; Schonrogge, Burkhard; Cremer, Joseph; and Dany, Franz-Josef, 4,170,508, Cl. 156-308.000.
Schreiber, Sidney P.: *See*—
Harper, Robert J., Jr.; Calamari, Timothy A., Jr.; and Schreiber, Sidney P., 4,170,670, Cl. 427-341.000.
Schroter, Jurgen: *See*—
Danziger, Harry; Kaiser, Bernd-Ulrich; Rampart, Guido; and Schroter, Jurgen, 4,170,592, Cl. 260-239.30A.
Schubert, Karl P. Electromagnetic brake. 4,170,278, Cl. 188-161.000.
Schubert and Salzer: *See*—
Bock, Erich, 4,170,101, Cl. 57-6.000.
Schulte, Allen G.: *See*—
Baumann, Gerald W.; Gambrell, Joseph L.; Hayes, George F.; Schell, Francis J.; and Schulte, Allen G., 4,170,349, Cl. 271-296.000.
Schultz, Theodore: *See*—
Mann, Jerry; and Schultz, Theodore, 4,170,071, Cl. 33-265.000.
Schutz, Gerhard; and Kocher, Rolf, to Sulzer Brothers Limited. Plastics-processing machine. 4,170,446, Cl. 425-199.000.
Schwab, Gerhart: *See*—
Shackle, Dale R.; and Schwab, Gerhart, 4,170,483, Cl. 106-21.000.
Schwartzstein, Marvin, to York Luggage Corporation. Luggage. 4,170,282, Cl. 190-43.000.
Schwarz, Maurice L., to Parker-Hannifin Corporation. Bleeder harness for brake master cylinders. 4,170,280, Cl. 188-352.000.
Schweizerische Lokomotive- und Maschinenfabrik: *See*—
Vogel, Hans H., 4,170,179, Cl. 105-168.000.
Schwerko, Albert P.: *See*—
Herrington, Daniel R.; and Schwerko, Albert P., 4,170,569, Cl. 252-448.000.
SCM Corporation: *See*—
Klar, Erhard, 4,170,466, Cl. 75-0.50C.
Scott & Fetzer Company Stahl Division, The: *See*—
Kalis, George, Jr., 4,170,119, Cl. 70-221.000.
Scott, John F., to Proctor & Schwartz, Inc. Nozzle for web processing apparatus. 4,170,075, Cl. 34-160.000.
Scott, William R., to United States of America, Navy. Material scanning apparatus. 4,170,144, Cl. 73-609.000.
Scripa, Lesleigh V.: *See*—
Lazarz, Christine A.; Cook, Edward H., Jr.; and Scripa, Lesleigh V., 4,170,540, Cl. 204-296.000.
Sea-Log Corporation: *See*—
Schirtzinger, Joseph F., 4,170,187, Cl. 114-264.000.
Seidel, Gunther; and Schmieder, Christian, to Braun Aktiengesellschaft. Shear-head for dryshavers. 4,170,060, Cl. 30-43.920.
Seitel, Norbert J.: *See*—
McDonald, Walter; and Seitel, Norbert J., 4,170,289, Cl. 198-479.000.
Sekida, Minoru; and Kimura, Kazuo, to Minolta Camera Kabushiki Kaisha. Light measuring devices for cameras with automatic exposure control. 4,170,410, Cl. 354-23.00R.
Sekikawa, Nobuyoshi: *See*—
Ikenoue, Shinpei; Masuda, Takao; Katsuyama, Harumi; Sekikawa, Nobuyoshi; Shishido, Tadao; and Sakai, Nobuo, 4,170,480, Cl. 96-114.100.
Selbach, Hans-Werner; and Diekmann, Manfred. Drive unit for extrusion device. 4,170,150, Cl. 74-410.000.
Senk, Heinz, to Spengler & Meurer. Hair-dressing scissors. 4,170,064, Cl. 30-195.000.
Serley, James E., to Rosemount Inc. Airspeed and relative direction indicator. 4,170,132, Cl. 73-178.00T.
Sette, Paul R.; and Storace, Anthony, to Pitney-Bowes, Inc. Apparatus for preventing the overload of a load cell. 4,170,270, Cl. 177-184.000.
Severud, Christopher N., Jr.: *See*—
Pappas, Michael; Witte, Paul A.; and Severud, Christopher N., Jr., 4,170,189, Cl. 116-106.000.
Shackle, Dale R.; and Schwab, Gerhart, to Mead Corporation, The. Process for the production of self-contained carbonless copy record sheets and coating composition for use therein. 4,170,483, Cl. 106-21.000.
Shadowen, James H.: *See*—
Egan, William J., Jr.; Hanloser, Kurt J.; and Shadowen, James H., 4,170,109, Cl. 60-204.000.
Lewis, George D.; and Shadowen, James H., 4,170,111, Cl. 60-261.000.
Shafer, Homer J. Piston operator for imparting rotary motion. 4,170,169, Cl. 92-130.00R.
Shaffer, William B.: *See*—
Ditty, Allan V.; and Shaffer, William B., 4,170,174, Cl. 99-538.000.
Sharamkin, Vladimir I.: *See*—
Butseniex, Imant E.; Levina, Margarita Y.; Prostyakov, Alexandr A.; Stolov, Mikhail Y.; Sharamkin, Vladimir I.; and Scherbinin, Eduard V., 4,170,713, Cl. 13-29.000.
Sharpell, Frederick H., Jr.: *See*—
Brandman, Harold A.; Freudewald, Joachim E.; Manowitz, Milton; Nikawitz, Edward J.; and Sharpell, Frederick H., Jr., 4,170,704, Cl. 546-290.000.
Shaw, Clarence W., to J. Ray McDermott & Co., Inc. Anchored offshore structure with sway control apparatus. 4,170,186, Cl. 114-264.000.
Shaw, Henry: *See*—
Goldstein, H. Lawrence; and Shaw, Henry, 4,170,447, Cl. 423-215.500.
Shaw, Wilfrid G.: *See*—
Zagata, Robert J.; Shaw, Wilfrid G.; and Woodbury, David R., 4,170,570, Cl. 252-437.000.
Sheehan, Gerard M.: *See*—
Blake, David W.; Sheehan, Gerard M.; Rowland, John D.; and Roberts, George L., 4,170,485, Cl. 106-300.000.
Shepperd, Michael E., to General Aviation Electronics, Inc. Versatile transceiver coupling network. 4,170,756, Cl. 325-21.000.
Sherwin-Williams Company, The: *See*—
Carr, Richard P., 4,170,521, Cl. 203-6.000.

Shimokura, Toshiko, to Konishiroku Photo Industry Co., Ltd. Retro focus type wide angle lens. 4,170,403, Cl. 350-216.000.
Shinbo, Katsutoshi; and Hosokawa, Takanori, to Hitachi, Ltd. Method of operating a nuclear reactor. 4,170,516, Cl. 176-20.00R.
Shinkai, Kinya: *See—*
Yoshida, Susumu; Ishigaki, Yoshio; Shinkai, Kinya; and Tsuchiya, Takao, 4,170,785, Cl. 358-242.000.
Shirai, Shigeru: *See—*
Ueda, Yasukiyo; Mori, Keijiro; Mori, Keiichi; Tanahashi, Takashi; and Shirai, Shigeru, 4,170,339, Cl. 251-138.000.
Shishido, Tadao: *See—*
Ikenoue, Shinpei; Masuda, Takao; Katsuyama, Harumi; Sekikawa, Nobuyoshi; Shishido, Tadao; and Sakai, Nobuo, 4,170,480, Cl. 96-114.100.
Shishkov, Mikhail I.: *See—*
Bobrov, Gennady N.; Shishkov, Mikhail I.; Kuzin, Gennady I.; Ivanov, Evgeny G.; and Akimov, Igor M., 4,170,737, Cl. 250-442.000.
Shope, Arthur R., Jr.: *See—*
Lemeshewsky, George P.; Dando, Thomas O.; Shope, Arthur R., Jr.; and Kuck, Kenneth D., 4,170,415, Cl. 355-22.000.
Short, Allie A.: *See—*
Beetschen, Robert E.; Lynch, Basil P.; and Short, Allie A., 4,170,682, Cl. 428-267.000.
Showa Denko K.K.: *See—*
Kawasaki, Keiji; and Takeshita, Tetsuo, 4,170,536, Cl. 204-290.00R.
Shuman, Jack N. Clamping frame for plastic forming apparatus. 4,170,449, Cl. 425-445.000.
Shutt, Paul B., to Bendix Corporation, The. Control for a two stage master cylinder. 4,170,386, Cl. 303-6.00C.
Siegfried, Roland: *See—*
Ruffner, Arno; and Siegfried, Roland, 4,170,054, Cl. 27-4.000.
Siemens Aktiengesellschaft: *See—*
Bayer, Eberhard, 4,170,413, Cl. 355-3.00R.
Behn, Reinhard; Lauber, Josef; Preibinger, Karl-Heinz; and Rheindorf, Hans-Heinz, 4,170,665, Cl. 427-79.000.
Koppehele, Frithjof, 4,170,761, Cl. 330-166.000.
Kraft, Heinz-Peter, 4,170,396, Cl. 350-3.700.
Meye, Wolfgang; and Schmidt, Ludwig, 4,170,404, Cl. 350-252.000.
Sommerfeldt, Heinz; and Kuklies, Karl, 4,170,395, Cl. 339-259.00F.
Sigmund Pulsometer Pumps Limited: *See—*
Candler, Nigel D. Q., 4,170,436, Cl. 415-73.000.
Sih, John C.: *See—*
Johnson, Roy A.; and Sih, John C., 4,170,703, Cl. 542-426.000.
Silvestrini, Jesus A., to California Processing Machinery. Method for pitting peaches. 4,170,660, Cl. 426-485.000.
Simmons, Robert B., to PPG Industries, Inc. Method of preparing a diaphragm having a gel of a hydrous oxide of zirconium in a porous matrix. 4,170,537, Cl. 204-295.000.
Simmons, Robert B., to PPG Industries, Inc. Diaphragm having zirconium and magnesium compounds in a porous matrix. 4,170,538, Cl. 204-295.000.
Simmons, Robert B., to PPG Industries, Inc. Diaphragm having zirconium oxide and a hydrophilic fluorocarbon resin in a hydrophobic matrix. 4,170,539, Cl. 204-295.000.
Simons, Hubert: *See—*
Roentgen, Paul; Simons, Hubert; and Nuding, Werner, 4,170,688, Cl. 428-433.000.
Simpson, Christopher J.: *See—*
Southward, Leonard B.; Simpson, Christopher J.; and Tunbridge, Charles R., 4,170,368, Cl. 280-242.0WC.
Singh, Anand P., to NRM Corporation. Tire press unloader. 4,170,442, Cl. 425-38.000.
Skinner, David L.; and Moon, Edward L., to Georgia Marble Company, The. Calcium carbonate filler. 4,170,658, Cl. 423-430.000.
Skudera, William J.; De Santis, Charles M.; and Ikrath, Kurt, deceased (by Ikrath, Gertrude, executrix), to United States of America, Army. Method of and apparatus for transmitting clandestine radio signals. 4,170,757, Cl. 325-32.000.
Smart, Colin: *See—*
Edwards, John R.; Rennie, George K.; Rosser, David A.; and Smart, Colin, 4,170,681, Cl. 428-205.000.
Smith, E. Quimby, to Q Corporation. Energy device powered by the motion of water beneath waves. 4,170,738, Cl. 290-42.000.
Smith, George F.: *See—*
Dubois, Robert A.; and Smith, George F., 4,170,623, Cl. 264-534.000.
Smith, Henry C. Solar heat collector. 4,170,220, Cl. 126-428.000.
Smith, Henry I.: *See—*
Flanders, Dale C.; Smith, Henry I.; and Dalomba, Muriel A., 4,170,512, Cl. 156-631.000.
Smith International, Inc.: *See—*
Trzeciak, Kurt H., 4,170,441, Cl. 418-48.000.
Smith Kline & French Laboratories Limited: *See—*
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., 4,170,652, Cl. 424-263.000.
Smith, Robert H., to Atlantic Richfield Company. Inhibiting spontaneous combustion of coal char. 4,170,456, Cl. 44-1.00F.
Smolinski, Donald E. Frame for a chopper-type motorcycle. 4,170,272, Cl. 180-227.000.
Smrt, Thomas J. Hanging flower pot. 4,170,089, Cl. 47-67.000.
Smura, Bronislaw B., to Allied Chemical Corporation. Membrane securing device. 4,170,535, Cl. 204-279.000.
Snamprogetti, S.p.A.: *See—*
Pagani, Giorgio, 4,170,514, Cl. 159-18.000.
Sobotta, Reinhard; and Mankau, Dieter, to Rollei-Werke Franke & Heidecke. Still projector with cover. 4,170,409, Cl. 353-119.000.
S.A. des Etablissements Francois Salmon & Fils: *See—*
Salomon, Georges P. J., 4,170,372, Cl. 280-626.000.
Societe Anonyme Potain Pioclain Materiel (P.P.M.): *See—*
Pelletier, Claude, 4,170,279, Cl. 188-300.000.
Societe Anonyme: Tournerie du Jura-Ets A. Bourbon & Fils: *See—*
Bourbon, Jean, 4,170,423, Cl. 402-70.000.
Societe Lab: *See—*
Vicard, Jean-Francois, 4,170,555, Cl. 210-74.000.
Soeda, Katsuji, to Yamamoto Electric Industrial Co., Ltd. Speed control circuit for a series motor. 4,170,749, Cl. 318-331.000.
Somatronics, Inc.: *See—*
Criglar, John J.; and Petraki, Lawrence T., 4,170,225, Cl. 128-733.000.
Sommerfeldt, Heinz; and Kuklies, Karl, to Siemens Aktiengesellschaft. Contact for the base portions of low voltage-heavy duty safety fuses. 4,170,395, Cl. 339-259.00F.
Sonoco Products Company: *See—*
Beasley, Marion W.; Swenson, Dale R.; Moore, Sidney E.; Brooking, Hurley R.; and Carroll, Harlan L., 4,170,170, Cl. 93-37.00R.
Beasley, Marion W., 4,170,171, Cl. 93-37.00R.
Sony Corporation: *See—*
Ishibashi, Hisanori; and Tajima, Tsuneso, 4,170,721, Cl. 179-111.00R.
Ohsawa, Mitsuo, 4,170,360, Cl. 274-23.00R.
Umeda, Kaoru, 4,170,760, Cl. 325-456.000.
Yoshida, Susumu; Ishigaki, Yoshio; Shinkai, Kinya; and Tsuchiya, Takao, 4,170,785, Cl. 358-242.000.
Southward Engineering Co. Limited: *See—*
Southward, Leonard B.; Simpson, Christopher J.; and Tunbridge, Charles R., 4,170,368, Cl. 280-242.0WC.
Southward, Leonard B.; Simpson, Christopher J.; and Tunbridge, Charles R., to Southward Engineering Co. Limited. Transportation of disabled or invalided persons. 4,170,368, Cl. 280-242.0WC.
Spanjer, Keith G.: *See—*
Olsen, Dennis R.; and Spanjer, Keith G., 4,170,472, Cl. 75-175.00A.
Spaw, Robert L., to Automatic Terminal Information Systems, Inc. Level measuring system. 4,170,311, Cl. 414-289.000.
Spenadel, Lawrence; and Banks, S. Alexander, to Exxon Research & Engineering Co. Resilient radiation-curable automotive body components. 4,170,664, Cl. 427-44.000.
Spengler & Meurer: *See—*
Senk, Heinz, 4,170,064, Cl. 30-195.000.
Spetsialnoe Konstruktorskoe Bjuro Biologicheskogo Priborotroenia Akademii Nauk SSSR: *See—*
Bobrov, Gennady N.; Shishkov, Mikhail I.; Kuzin, Gennady I.; Ivanov, Evgeny G.; and Akimov, Igor M., 4,170,737, Cl. 250-442.000.
Spevak, Stephen T., to Potomac Applied Mechanics, Inc. Article supporting arrangement. 4,170,392, Cl. 312-283.000.
Spicer, Leonard A.; McGee, Derek J.; and Elson, Ian H., to Gestetner Limited. Planographic printing plate for dry printing. 4,170,687, Cl. 428-421.000.
Spinney Creek Oyster Company: *See—*
Walker, Ian M., 4,170,197, Cl. 119-4.000.
Sprenger, Hans-Ernst: *See—*
Hegenberg, Peter, deceased; Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helmut; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, 4,170,588, Cl. 260-45.80N.
Spruth, Wilhelm G.: *See—*
Bahr, Dietrich J.; Burckardt, Karl H.; and Spruth, Wilhelm G., 4,170,779, Cl. 346-139.00C.
Sta-Rite Industries, Inc.: *See—*
Johnson, Gary, 4,170,246, Cl. 137-596.120.
Stabinger, Hans: *See—*
Kratky, Otto; Leopold, Hans; and Stabinger, Hans, 4,170,128, Cl. 73-30.000.
Stanadyne, Inc.: *See—*
Janik, Leon P., Jr., 4,170,210, Cl. 123-179.00F.
Standard Oil Company: *See—*
Herrington, Daniel R.; and Schwerko, Albert P., 4,170,569, Cl. 252-448.000.
West, C. Thomas, 4,170,562, Cl. 252-51.50A.
Standard Oil Company (Ohio): *See—*
Zagata, Robert J.; Shaw, Wilfrid G.; and Woodbury, David R., 4,170,570, Cl. 252-437.000.
Stauffer Chemical Company: *See—*
Fannin, Loyd W., 4,170,603, Cl. 260-448.00A.
Large, George B., 4,170,463, Cl. 71-86.000.
Malpass, Dennis B.; and Watson, Spencer C., 4,170,604, Cl. 260-448.00A.
Stauffer, Harry C.: *See—*
Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., 4,170,545, Cl. 208-210.000.
Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., 4,170,546, Cl. 208-210.000.
Steimle, Wayne D. Hydrotherapy apparatus and ducting therefor. 4,170,044, Cl. 4-172.150.
Stella, Joseph A., to Polaroid Corporation. Sound film cassette employing separating web. 4,170,407, Cl. 352-72.000.
Stephan, Wolfgang; and Kotitschke, Ronald, to Biotest-Serum-Institut GmbH. Ion exchanger treatment of citrate-stabilized plasma. 4,170,590, Cl. 260-112.00B.

Stevens, Frank H.: *See—*
Urfer, Allen D.; and Stevens, Frank H., 4,170,678, Cl. 428-124.000.

Stevens, John W.: *See—*
Angelastro, Leonard W., 4,170,333, Cl. 248-110.000.

Stimple, James R.; and Erickson, Paul M., to Motorola, Inc. Antenna sampling system. 4,170,759, Cl. 325-51.000.

Stoelting, Inc.: *See—*
Martineau, Tom M., 4,170,136, Cl. 73-322.000.

Stolov, Mikhail Y.: *See—*
Butseniex, Imant E.; Levina, Margarita Y.; Prostyakov, Alexandr A.; Stolov, Mikhail Y.; Sharamkin, Vladimir I.; and Scherbinin, Eduard V., 4,170,713, Cl. 13-29.000.

Stone, Clement A., to Merck & Co., Inc. Antihypertensive compositions containing N-heterocyclicalanines and α-hydrazinoarylpropionic acid/ester. 4,170,654, Cl. 424-283.000.

Storace, Anthony: *See—*
Sette, Paul R.; and Storace, Anthony, 4,170,270, Cl. 177-184.000.

Stricker, Ira J., to General Motors Corporation. Electronic control for a mechanized spray painting system. 4,170,751, Cl. 318-563.000.

Strike, Donald P.; and Kao, Wenling, to American Home Products Corporation. Prostaglandin derivatives. 4,170,710, Cl. 562-503.000.

Striso, Rainer: *See—*
Josten, Friedrich; Cherubim, Martin; and Striso, Rainer, 4,170,611, Cl. 525-494.000.

Strutman, Lauren: *See—*
Strutman, Warren A., 4,170,369, Cl. 280-261.000.

Strutman, Lisa: *See—*
Strutman, Warren A., 4,170,369, Cl. 280-261.000.

Strutman, Warren A., to Strutman, Lauren; Strutman, Lisa; and Gross, Jerome A. Bicycle wheel suspension, driving and braking assembly. 4,170,369, Cl. 280-261.000.

Stubbings, James H., to Potomac Applied Mechanics, Inc. Bracket mount for lock box. 4,170,324, Cl. 224-279.000.

Studer, Willi: *See—*
Zwicky, Paul; and Marthaler, Eduard, 4,170,361, Cl. 274-23.00A.
Zwicky, Paul; and Marthaler, Eduard, 4,170,362, Cl. 274-23.00A.

Stumpe, Werner, to Robert Bosch GmbH. Automatic load dependent brake force controller. 4,170,387, Cl. 303-22.00R.

Stussman, Gerald J.: *See—*
Codina, Jorge G.; Estelle, Weems E.; and Stussman, Gerald J., 4,170,735, Cl. 250-422.000.

Suarez, Jacinto F.: *See—*
Moreno, Miguel A. P.; Cil, Jorge A.; Montero, Justo B.; Novais, Guillermo B.; Morales, Jose A. R.; Montalvo, Fernando C.; Rivero, Armando A.; Castro, Mario J. M.; and Suarez, Jacinto F., 4,170,098, Cl. 56-13.900.

Sugimoto, Norihiko, to Hitachi, Ltd. Corrective method of reproducing magnetic memory signals and apparatus for carrying out the same. 4,170,786, Cl. 360-40.000.

Suh, Nam P.; and Tucker, Charles L., III, to Massachusetts Institute of Technology. Apparatus for controlling fluid flow in a fluid delivery and mixing system utilizing positive displacement devices. 4,170,319, Cl. 222-134.000.

Sulzer Brothers Limited: *See—*
Naegeli, John P., 4,170,388, Cl. 308-15.000.
Schutz, Gerhard; and Kocher, Rolf, 4,170,446, Cl. 425-199.000.

Sumitomo Chemical Company, Limited: *See—*
Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, 4,170,696, Cl. 521-29.000.

Sun Electric Corporation: *See—*
Bowers, Mark C., 4,170,140, Cl. 73-462.000.

Suzuki, Mikio: *See—*
Kondo, Yukio; Kawabata, Minoru; and Suzuki, Mikio, 4,170,438, Cl. 417-223.000.

Swapp, Mavin C.: *See—*
Frisbie, Milo W.; and Swapp, Mavin C., 4,170,290, Cl. 198-524.000.

Swearingen, Judson S. Thrust controlled rotary apparatus. 4,170,435, Cl. 415-1.000.

Sweet, Edward, to SWS Silicones Corporation. Method for accelerating surface curing of organopolysiloxane compositions. 4,170,700, Cl. 528-12.000.

Swenson, Dale R.: *See—*
Beasley, Marion W.; Swenson, Dale R.; Moore, Sidney E.; Brooking, Hurley R.; and Carroll, Harlan L., 4,170,170, Cl. 93-37.00R.

Swiss Aluminium Ltd.: *See—*
Alder, Hanspeter; and Boving, Hans, 4,170,533, Cl. 204-243.00R.

SWS Silicones Corporation: *See—*
Sweet, Edward, 4,170,700, Cl. 528-12.000.

Sziklas, Edward A., to United Technologies Corporation. Resonator having coupled cavities with intercavity beam expansion elements. 4,170,405, Cl. 350-299.000.

Taguchi, Tatsuya; Iura, Yukio; Takishima, Yoshiyuki; and Fullagar, David, to Canon Kabushiki Kaisha. Control circuit for a memory type electric shutter. 4,170,411, Cl. 354-24.000.

Tajima, Osamu, to Victor Company of Japan, Ltd. Signal pickup device for reproducing an information signal recorded on a track of a rotary recording medium. 4,170,783, Cl. 358-128.000.

Tajima, Tsuneso: *See—*
Ishibashi, Hisanori; and Tajima, Tsuneso, 4,170,721, Cl. 179-111.00R.

Takada, Juichiro, to Takata Kojyo Co., Ltd. Emergency locking vehicle safety belt retractor. 4,170,329, Cl. 242-107.40B.

Takahashi, Shigeo: *See—*
Mizuno, Kiyohumi; Maeda, Hiroaki; and Takahashi, Shigeo, 4,170,153, Cl. 74-868.000.

Takahashi, Takashi: *See—*
Ichinose, Noboru; Ohkuma, Hideo; Takahashi, Takashi; and Takei, Masayoshi, 4,170,770, Cl. 340-634.000.

Takano, Toshio: *See—*
Kodama, Masayuki; Takano, Toshio; and Makishima, Sadao, 4,170,273, Cl. 180-233.000.

Takata Kojyo Co., Ltd.: *See—*
Takada, Juichiro, 4,170,329, Cl. 242-107.40B.

Takei, Masayoshi: *See—*
Ichinose, Noboru; Ohkuma, Hideo; Takahashi, Takashi; and Takei, Masayoshi, 4,170,770, Cl. 340-634.000.

Takeshita, Tetsuo: *See—*
Kawasaki, Keiji; and Takeshita, Tetsuo, 4,170,536, Cl. 204-290.00R.

Takeuchi, Jim S.: *See—*
Fitzsimmons, George W.; Robinson, Lawrence W.; and Takeuchi, Jim S., 4,170,773, Cl. 343-6.50R.

Takeuchi, Yukihisa; and Horie, Kouji, to Nippondenso Co., Ltd. Internal combustion engine with reformed gas generator. 4,170,200, Cl. 123-3.000.

Takishima, Yoshiyuki: *See—*
Taguchi, Tatsuya; Iura, Yukio; Takishima, Yoshiyuki; and Fullagar, David, 4,170,411, Cl. 354-24.000.

Talikka, Raimo. Method and means for hardening and hot-zincing iron and steel products. 4,170,495, Cl. 148-15.000.

Tamburelli, Giovanni, to CSELT—Centro Studi e Laboratori Telecomunicazioni S.p.A. Process and device for the nonlinear equalization of digital signals. 4,170,758, Cl. 325-42.000.

Tanahashi, Takashi: *See—*
Ueda, Yasukiyo; Mori, Keijiro; Mori, Keiichi; Tanahashi, Takashi; and Shirai, Shigeru, 4,170,339, Cl. 251-138.000.

Tanaka, Hiro: *See—*
Mori, Kaoru; Tanaka, Hiro; Ozawa, Hirosi; and Murakami, Yoichi, 4,170,582, Cl. 260-29.6RW.

Taniguchi, Masayuki: *See—*
Narita, Kiichi; Hara, Hiroshi; Taniguchi, Masayuki; Yamaguchi, Masaru; and Matumoto, Iwao, 4,170,139, Cl. 73-425.600.

Tanner, Jesse H. Visual approach system for aircraft. 4,170,767, Cl. 340-26.000.

Tapia, Graciano J., to Alcudia, Empresa Para la Industria Quimica, S.A. Method for growing plants or crops utilizing polyolefin covering material. 4,170,087, Cl. 47-29.000.

Tatemoto, Minoru: *See—*
Kumagai, Naotake; and Tatemoto, Minoru, 4,170,259, Cl. 165-11.000.

Tattanelli, Robert: *See—*
Brorein, William J.; and Tattanelli, Robert, 4,170,510, Cl. 156-432.000.

Tatum, Joe F., to C. E. Equipment, Inc. Deep well platinized anode carrier for cathodic protection system. 4,170,532, Cl. 204-196.000.

Taylor, William H.: *See—*
Bennett, Robert B.; McMordie, Warren C., Jr.; and Taylor, William H., 4,170,248, Cl. 138-97.000.

Teledyne Sprague Engineering Division of Teledyne, Inc.: *See—*
Magnus, Harve W.; and Masur, Vincent J., 4,170,489, Cl. 134-22.00R.

Temple University: *See—*
Love, Peter; and Labes, Mortimer M., 4,170,477, Cl. 96-36.200.

Terashima, Shiro: *See—*
Yamada, Shun-Ichi; Terashima, Shiro; Nagakura, Masahiko; and Nara, Munehiko, 4,170,596, Cl. 260-326.470.

Tetro, Richard S., to Black Clawson Company, The. Air separator method and apparatus. 4,170,457, Cl. 55-46.000.

Texaco Inc.: *See—*
Crawford, Wheeler C.; and Wilson, James R., 4,170,484, Cl. 106-281.00N.

Texas Instruments Incorporated: *See—*
Bartlett, Keith G.; Jordan, Laurence R.; and Mundt, Randall S., 4,170,492, Cl. 148-1.500.
Bilek, Frank T., 4,170,422, Cl. 400-120.000.
Jost, Ernest M.; Reenstra, Arthur L.; and Trenkler, George, 4,170,498, Cl. 148-121.000.

Textron Inc.: *See—*
O'Keefe, George F.; Roy, Donald A.; and Byam, Erwin B., 4,170,051, Cl. 10-12.500.

Thermal Dynamics Corporation: *See—*
Wilkins, Raymond, 4,170,727, Cl. 219-121.00P.

Thermoplastic Compounders Limited: *See—*
Clapp, John W. M., 4,170,241, Cl. 134-83.000.

Thomas & Betts Corporation: *See—*
Izraeli, Hyman, 4,170,154, Cl. 81-313.000.

Thomas, Gareth; and Rao, Bangaru V. N., to University of California, The Regents of the. High strength, tough alloy steel. 4,170,497, Cl. 148-36.000.

Thomas, Gareth; and Rao, Bangaru V. N., to University of California, The Regents of the. Method of making high strength, tough alloy steel. 4,170,499, Cl. 148-143.000.

Thomas, James H., to National Distillers & Chemical Corporation. Process, apparatus and resulting three-layer needled nonwoven fabric. 4,170,676, Cl. 428-113.000.

Thompson, Gregory J.: *See—*
Cutter, Lois M.; Crawford, John R.; and Thompson, Gregory J., 4,170,626, Cl. 422-143.000.

Tibbetts, Bruce S.: *See—*
Pond, Robert B., Sr.; Winter, John M., Jr.; and Tibbetts, Bruce S., 4,170,257, Cl. 164-87.000.
TMC Corporation: *See—*
Weigl, Erwin; and Himmetsberger, Alois, 4,170,371, Cl. 280-625.000.
Toagosei Chemical Industry Co., Ltd.: *See—*
Motegi, Akira; and Kimura, Kaoru, 4,170,585, Cl. 260-33.20R.
Todd, Robert B.: *See—*
Robertson, George H.; Rooney, Robert L.; and Todd, Robert B., 4,170,487, Cl. 106-309.000.
Toelle, Alvin D.: *See—*
Camp, John; Toelle, Alvin D.; and Wen, Gene Y., 4,170,201, Cl. 123-32.0EE.
Tokorozawa Electronic Corporation: *See—*
Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, 4,170,742, Cl. 310-324.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Ichinose, Noboru; Ohkuma, Hideo; Takahashi, Takashi; and Takei, Masayoshi, 4,170,770, Cl. 340-634.000.
Tomizawa, Yoshio: *See—*
Satoh, Ken; and Tomizawa, Yoshio, 4,170,790, Cl. 364-705.000.
Toray Industries, Inc.: *See—*
Akama, Tadashi; and Sakai, Kuniyuki, 4,170,481, Cl. 96-115.00P.
Toshiba Kikai Kabushiki Kaisha: *See—*
Iida, Mitsuhiko; Kato, Yasuo; Baba, Kazuyuki; and Fujie, Hideo, 4,170,177, Cl. 101-365.000.
Totino, Rose W.; Behnke, James R.; Westover, Jack D.; and Keller, Richard L., to Pillsbury Company, The. Fried dough product and method. 4,170,659, Cl. 426-95.000.
Tourres, Francois G., to International Glass Equipment Co. S.A.R.L. Apparatus and method for optical control of the profile of a body utilizing a planar laser beam. 4,170,417, Cl. 356-385.000.
Townsend, Ralph G. Holding clamp assembly. 4,170,345, Cl. 269-88.000.
Toyoda-Koki Kabushiki-Kaisha: *See—*
Kondo, Yukio; Kawabata, Minoru; and Suzuki, Mikio, 4,170,438, Cl. 417-223.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Bessho, Hironori, 4,170,112, Cl. 60-278.000.
Kondo, Yukio; Kawabata, Minoru; and Suzuki, Mikio, 4,170,438, Cl. 417-223.000.
Mori, Kouichi; Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; and Morino, Seiji, 4,170,212, Cl. 123-211.000.
Trenkler, George: *See—*
Jost, Ernest M.; Reenstra, Arthur L.; and Trenkler, George, 4,170,498, Cl. 148-121.000.
Triesch, Willi: *See—*
Remberg, Axel; and Triesch, Willi, 4,170,364, Cl. 277-53.000.
Trost, Wayne C., to Barber-Colman Company. Warp length compensator for a triaxial weaving machine. 4,170,249, Cl. 139-11.000.
TRW Inc.: *See—*
Blazek, William S.; Piwonka, Thomas S.; Jackson, James D.; and Atanmo, Philip N., 4,170,256, Cl. 164-26.000.
Gerken, John M., 4,170,473, Cl. 75-208.00R.
Marcus, Bruce D.; and Edwards, Donald K., 4,170,262, Cl. 165-105.000.
Trzeciak, Kurt H., to Smith International, Inc. Speed changer for in-hole motors. 4,170,441, Cl. 418-48.000.
Tsang, Floris Y.: *See—*
Brown, William E.; and Tsang, Floris Y., 4,170,695, Cl. 429-193.000.
Tsuchiya, Osamu: *See—*
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,170,642, Cl. 424-180.000.
Tsuchiya, Takao: *See—*
Yoshida, Susumu; Ishigaki, Yoshio; Shinkai, Kinya; and Tsuchiya, Takao, 4,170,785, Cl. 358-242.000.
Tucker, Charles L., III: *See—*
Suh, Nam P.; and Tucker, Charles L., III, 4,170,319, Cl. 222-134.000.
Tunbridge, Charles R.: *See—*
Southward, Leonard B.; Simpson, Christopher J.; and Tunbridge, Charles R., 4,170,368, Cl. 280-242.0WC.
Turiot, Andre: *See—*
Masciet, Jean; and Turiot, Andre, 4,170,332, Cl. 244-102.00R.
Turner, Maxwell J.: *See—*
Lloyd, Robert; and Turner, Maxwell J., 4,170,312, Cl. 224-4.00B.
Turner, William F. Aldol condensation process. 4,170,609, Cl. 260-586.00C.
Tyler, Wesley R.: *See—*
Deffeyes, Robert J.; and Tyler, Wesley R., 4,170,602, Cl. 260-439.00R.
Uchiyama Kogyo Kaisha, Ltd.: *See—*
Nishijima, Kunihiro, 4,170,445, Cl. 425-126.00R.
Uchiyama, Toshihiko: *See—*
Nakajyo, Noriaki; and Uchiyama, Toshihiko, 4,170,524, Cl. 204-15.000.
Ueda, Yasukiyo; Mori, Keijiro; Mori, Keiichi; Tanahashi, Takashi; and Shirai, Shigeru, to Matsushita Electric Industrial Company. Analog displacement type electromagnetic valve. 4,170,339, Cl. 251-138.000.
Uhlig, Albert R., to Owens-Illinois, Inc. Method of making a blown hollow article having a ribbed interior surface. 4,170,622, Cl. 264-520.000.
Ultra-Sort Corp.: *See—*
Marshall, William F.; and Arild, Tor, 4,170,306, Cl. 209-549.000.
Umeda, Kaoru, to Sony Corporation. Radio receiver with frequency selection and muting. 4,170,760, Cl. 325-456.000.
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Derivatives of kanamycin A. 4,170,642, Cl. 424-180.000.
Umezawa, Hamao: *See—*
Akita, Eiichi; Horiuchi, Yukio; Miyazawa, Takeo; and Umezawa, Hamao, 4,170,641, Cl. 424-180.000.
Umezawa, Sumio: *See—*
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,170,642, Cl. 424-180.000.
Underhill, Thomas T.: *See—*
Hubert, Wallace L.; and Underhill, Thomas T., 4,170,414, Cl. 355-14.000.
Underwood, Gene E. Fluid mixing system. 4,170,420, Cl. 366-137.000.
Union Carbide Corporation: *See—*
Goeke, George L.; Hamer, Anthony D.; and Karol, Frederick J., 4,170,589, Cl. 260-45.95H.
Kosseim, Alexander J.; Dunnery, David A.; and Atwood, Gilbert R., 4,170,628, Cl. 423-243.000.
Kurtz, Abraham N.; Cunningham, Robert W.; and Naumann, Alfred W., 4,170,572, Cl. 252-455.00R.
Meriadec, Brigette; and Roubertie, Patrice, 4,170,454, Cl. 23-230.600.
Ritscher, James S., 4,170,571, Cl. 252-455.00Z.
United Aircraft Products, Inc.: *See—*
Freshcorn, Ivan G., 4,170,554, Cl. 210-50.000.
United States of America
Agriculture: *See—*
Harper, Robert J., Jr.; Calamari, Timothy A., Jr.; and Schreiber, Sidney P., 4,170,670, Cl. 427-341.000.
Young, James W.; and Furniss, Malcolm M., 4,170,631, Cl. 424-19.000.
Air Force: *See—*
Masak, Raymond J.; Baurle, Herbert F.; and Kowalski, Anthony M., 4,170,775, Cl. 343-100.0LE.
Army: *See—*
Bly, Vincent T., 4,170,771, Cl. 340-781.000.
Bly, Vincent T., 4,170,772, Cl. 340-781.000.
Cox, John T.; Garber, Michael B.; Jasper, Marilyn A.; and Longshore, Randolph E., 4,170,781, Cl. 357-30.000.
Hutcheson, Edward T., 4,170,677, Cl. 428-119.000.
Skudera, William J.; De Santis, Charles M.; and Ikrath, Kurt, deceased, 4,170,757, Cl. 325-32.000.
Energy: *See—*
Booman, Glenn L.; and Phelps, Frank R., 4,170,135, Cl. 73-290.00R.
Interior: *See—*
Lee, Calvin K.; and Chaiken, Robert F., 4,170,668, Cl. 427-223.000.
Lemeshewsky, George P.; Dando, Thomas O.; Shope, Arthur R., Jr.; and Kuck, Kenneth D., 4,170,415, Cl. 355-22.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
MacDoran, Peter F. System for near real-time crustal deformation monitoring. 4,170,776, Cl. 343-112.00D.
Navy: *See—*
Boehm, Helmut, 4,170,424, Cl. 403-164.000.
Nielsen, Arnold T., 4,170,706, Cl. 548-356.000.
Nielsen, Arnold T., 4,170,707, Cl. 548-356.000.
Scott, William R., 4,170,144, Cl. 73-609.000.
United States Steel Corporation: *See—*
Koon, David L., 4,170,121, Cl. 72-1.000.
Regitz, Lester J., 4,170,468, Cl. 75-58.000.
United Technologies Corporation: *See—*
Durno, Ronald A.; and Cooper, Dean E., 4,170,147, Cl. 74-96.000.
Egan, William J., Jr.; Hanloser, Kurt J.; and Shadowen, James H., 4,170,109, Cl. 60-204.000.
Lewis, George D.; and Shadowen, James H., 4,170,111, Cl. 60-261.000.
Schaefer, Carl F., 4,170,774, Cl. 343-16.00M.
Sziklas, Edward A., 4,170,405, Cl. 350-299.000.
University of California, The Regents of the: *See—*
Thomas, Gareth; and Rao, Bangaru V. N., 4,170,497, Cl. 148-36.000.
Thomas, Gareth; and Rao, Bangaru V. N., 4,170,499, Cl. 148-143.000.
UOP Inc.: *See—*
Cutter, Lois M.; Crawford, John R.; and Thompson, Gregory J., 4,170,626, Cl. 422-143.000.
Ginger, Edward A., 4,170,627, Cl. 423-239.000.
Upjohn Company, The: *See—*
Axen, Udo F., 4,170,598, Cl. 260-346.220.
Johnson, Roy A.; and Sih, John C., 4,170,703, Cl. 542-426.000.
Urfer, Allen D.; and Stevens, Frank H., to A. E. Staley Manufacturing Company. Multiple use article for conditioning fabrics in a clothes dryer. 4,170,678, Cl. 428-124.000.
Usami, Toshimasa, to Fuji Photo Film Co., Ltd. Multi-layer color light-sensitive material. 4,170,479, Cl. 96-68.000.
Vallance, James K.: *See—*
Rao, V. Durga Nageswar; Rahnke, Christian J.; Fucinari, Carlo A.; and Vallance, James K., 4,170,620, Cl. 264-230.000.

Van Tyne, Richard G.; Sanders, Weldon A., Jr.; De La Matyr, Richard D.; and Gates, David L., to Camsco, Inc. Optical web inspection system. 4,170,419, Cl. 356-431.000.

Varian Associates, Inc.: *See*—
Lamont, Lawrence T., Jr., 4,170,541, Cl. 204-298.000.

Vcala, Vlastimil. Visual aid practice tennis ball. 4,170,352, Cl. 273-29.00A.

VDO, Adolf Schindling AG: *See*—
Collonia, Harald, 4,170,274, Cl. 180-179.000.

Veda, Inc.: *See*—
Buschbom, Floyd E.; Hansen, Glen D.; and Paulson, Jerome T., 4,170,385, Cl. 406-59.000.

Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See*—
Mullner, Paul; and Wildling, Ernst, 4,170,076, Cl. 34-217.000.

Vicard, Jean-Francois, to Societe Lab. Methods and apparatus for centrifugal treatment of fluids containing impurities in suspension. 4,170,555, Cl. 210-74.000.

Victor Company of Japan, Ltd.: *See*—
Tajima, Osamu, 4,170,783, Cl. 358-128.000.

Villanueva, Charles V. Theft-deterrent bracket for smoke alarms. 4,170,334, Cl. 248-553.000.

Villanueva, Jesus T.: *See*—
Villanueva, Juan T.; and Villanueva, Jesus T., 4,170,286, Cl. 198-628.000.

Villanueva, Juan T.; and Villanueva, Jesus T. Apparatus for defibering sheaths of fibrous material, particularly sheaths of abaca. 4,170,286, Cl. 198-628.000.

Vinals, Joaquin F.: *See*—
Withycombe, Donald A.; Mookherjee, Braja D.; Vock, Manfred H.; and Vinals, Joaquin F., 4,170,236, Cl. 131-2.000.

Vock, Manfred H.: *See*—
Withycombe, Donald A.; Mookherjee, Braja D.; Vock, Manfred H.; and Vinals, Joaquin F., 4,170,236, Cl. 131-2.000.

Vogel, Hans H., to Schweizerische Lokomotive- und Maschinenfabrik. Railway vehicle steering truck. 4,170,179, Cl. 105-168.000.

Vogl, Rudolf: *See*—
Laber, Walter; Vogl, Rudolf; and Fahrnschon, Wolfgang, 4,170,263, Cl. 165-158.000.

Vogt, Berthold R.: *See*—
Wade, Peter C.; and Vogt, Berthold R., 4,170,651, Cl. 424-258.000.

Volksen, Willi: *See*—
Rembaum, Alan; Gupta, Amitava; and Volksen, Willi, 4,170,685, Cl. 428-402.000.

Vostovich, Joseph E.: *See*—
Rothenberg, Sidney; and Vostovich, Joseph E., 4,170,575, Cl. 252-511.000.

W. R. Grace & Co.: *See*—
Ernest, Michael V.; and Maselli, James M., 4,170,573, Cl. 252-462.000.

Wacker-Chemie GmbH: *See*—
Deubzer, Bernward; and Brunner, Erich, 4,170,610, Cl. 525-100.000.

Wada, Shigetaka: *See*—
Watanabe, Tetsuo; and Wada, Shigetaka, 4,170,530, Cl. 204-195.00S.
Watanabe, Tetsuo; Wada, Shigetaka; and Mase, Shunzo, 4,170,531, Cl. 204-195.00S.

Wade, Peter C.; and Vogt, Berthold R., to E. R. Squibb & Sons, Inc. 2-Substituted-1H-benz-[de]-isoquinoline-1,3(2H)-diones. 4,170,651, Cl. 424-258.000.

Wagenknecht, Austin C., deceased (by Wagenknecht, Don Austin, personal representative); Daravingas, George V.; and Koski, William E., to General Mills, Inc. Plaque inhibiting compositions and method. 4,170,632, Cl. 424-48.000.

Wagenknecht, Austin C., deceased (by Wagenknecht, Don A., personal representative); Daravingas, George V.; and Koski, William E., to General Mills, Inc. Plaque inhibiting composition and method. 4,170,633, Cl. 424-48.000.

Wagenknecht, Don A., personal representative: *See*—
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,170,633, Cl. 424-48.000.

Wagenknecht, Don Austin, personal representative: *See*—
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,170,632, Cl. 424-48.000.

Wakselman, Claude: *See*—
Atlani, Martial; Corso, Vincent; Wakselman, Claude; Loutaty, Roben; and Yacono, Charles, 4,170,547, Cl. 208-326.000.

Walker, Ian M., to Spinney Creek Oyster Company. Method of raising oysters. 4,170,197, Cl. 119-4.000.

Walshe, James C. Electronic stethoscope. 4,170,717, Cl. 179-1.0ST.

Warner, John H. Method for detecting and a detector for indicating excessive temperature at electrical wiring devices. 4,170,190, Cl. 116-206.000.

Warner-Lambert Company: *See*—
Liu, Daniel T. H.; Irwin, John F.; and Pai, Rong-Chang, 4,170,639, Cl. 424-101.000.

Watakabe, Yaichiro, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing a gate turn-off thyristor. 4,170,502, Cl. 148-191.000.

Watanabe, Takeshi: *See*—
Katsumata, Mitsuo; Kondo, Tetsuya; and Watanabe, Takeshi, 4,170,208, Cl. 123-148.0CC.

Watanabe, Tetsuo; and Wada, Shigetaka, to NGK Insulators, Ltd. Oxygen concentration cell and a method of producing the same. 4,170,530, Cl. 204-195.00S.

Watanabe, Tetsuo; Wada, Shigetaka; and Mase, Shunzo, to NGK Insulators, Ltd. Method of producing an oxygen concentration cell. 4,170,531, Cl. 204-195.00S.

Waterbury, Nelson J. Vendable reclosable beverage container. 4,170,724, Cl. 200-346.000.

Watson, Spencer C.: *See*—
Malpass, Dennis B.; and Watson, Spencer C., 4,170,604, Cl. 260-448.00A.

Weaver, James C., to Massachusetts Institute of Technology. Apparatus for measuring reactant concentrations and quantities. 4,170,520, Cl. 435-288.000.

Weaver, John H. Radial arm saw cutting gauge. 4,170,158, Cl. 83-522.000.

Webb, Byron K.: *See*—
Hood, Clarence E., Jr.; Alper, Yekutiel; and Webb, Byron K., 4,170,100, Cl. 56-328.0TS.

Weber, Alfred; Kennecke, Mario; Popper, Alfred; Muller, Rudolf; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Neef, Gunter; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Microbiological conversion of sterol derivatives to 5-androsten-17-one derivatives and their use. 4,170,518, Cl. 435-55.000.

Weber, Wilbert D.: *See*—
Ashton, Robert; and Weber, Wilbert D., 4,170,235, Cl. 130-27.00T.

Weideman, Andries C. Solar heat energy collector. 4,170,223, Cl. 126-450.000.

Weierman, Robert J.; Merle, Joseph J.; Gordon, Gerald A.; Pan, Peter N. Y.; and Hernandez, Rafael J., to Continental Group, Inc., The. Container closure. 4,170,314, Cl. 220-260.000.

Weigl, Erwin; and Himmetsberger, Alois, to TMC Corporation. Ski binding part. 4,170,371, Cl. 280-625.000.

Weiss, Armin K.; and Clarke, John R., to Eastman Kodak Company. Plasma plating. 4,170,662, Cl. 427-38.000.

Weiss, Harald, to Hartmann & Braun Aktiengesellschaft. Monitoring nuclear radiation measuring channels. 4,170,733, Cl. 250-374.000.

Welch, Henry H. Automatic analyzer device for carrying out chemical-clinical and kinetic-enzymatic analyses on fluids, particularly biological fluids. 4,170,625, Cl. 422-64.000.

Wen, Gene Y.: *See*—
Camp, John; Toelle, Alvin D.; and Wen, Gene Y., 4,170,201, Cl. 123-32.0EE.

Werkzeugmaschinenfabrik Oerlikon-Buhrle: *See*—
Diewald, Gunther, 4,170,178, Cl. 102-29.000.

Werner, Jean J.: *See*—
Salz, Jack; and Werner, Jean J., 4,170,764, Cl. 332-17.000.

Wessel, John E., to Aerospace Corporation, The. Multi-photon photo-ionization trace vapor detector. 4,170,736, Cl. 250-423.00P.

West, C. Thomas, to Standard Oil Company. Phenol modified mannich reaction products from oxidized polymers. 4,170,562, Cl. 252-51.50A.

Westinghouse Electric Corp.: *See*—
Meuschke, Robert E.; Desmarchais, Walter E.; and Katz, Leonard R., 4,170,517, Cl. 176-87.000.
Schmitz, Johannes J.; and Heinrich, Theodore M., 4,170,754, Cl. 324-208.000.
Williams, David W., 4,170,741, Cl. 307-355.000.

Westley, John; and Liu, Chao-Min, to Hoffmann-La Roche Inc. 3-Ethyl-1,3-dihydro-3-methoxy-2H-indole 2-one. 4,170,595, Cl. 260-325.00R.

Westover, Jack D.: *See*—
Totino, Rose W.; Behnke, James R.; Westover, Jack D.; and Keller, Richard L., 4,170,659, Cl. 426-95.000.

Wetmore, Judson D., to Raychem Corporation. Self-heating articles and process. 4,170,296, Cl. 206-219.000.

Wheeler, Kenneth L., to Domore Office Furniture, Inc. Posture chair. 4,170,382, Cl. 297-306.000.

White, Bruce L.; Arter, Edward S.; and Kiner, Mark W., to Hesston Corporation. Bale disintegrator and method. 4,170,426, Cl. 414-111.000.

Whiteley, John, to Platt Saco Lowell Limited. Open end spinning rotor with special boss. 4,170,102, Cl. 57-58.890.

Wiebe, Gerald L. Thermometer and method of making same. 4,170,138, Cl. 73-371.000.

Wiechert, Rudolf: *See*—
Weber, Alfred; Kennecke, Mario; Popper, Alfred; Muller, Rudolf; Eder, Ulrich; Haffer, Gregor; Sauer, Gerhard; Neef, Gunter; and Wiechert, Rudolf, 4,170,518, Cl. 435-55.000.

Wiegers, Wilhelmus J.: *See*—
Hall, John B.; Wiegers, Wilhelmus J.; Hill, Ira D.; Novak, Robert M.; and Schmitt, Frederick L., 4,170,576, Cl. 252-522.000.

Wilczek, Stephen P.: *See*—
Daughton, John W.; Gillett, Kenneth; Nelson, Frank; and Wilczek, Stephen P., 4,170,791, Cl. 364-900.000.

Wild, Anton J. Packer grid block assembly with detachable guiding fingers. 4,170,096, Cl. 53-248.000.

Wildling, Ernst: *See*—
Mullner, Paul; and Wildling, Ernst, 4,170,076, Cl. 34-217.000.

Wilkins, Raymond, to Thermal Dynamics Corporation. Thermal torch height acquisition circuit. 4,170,727, Cl. 219-121.00P.

Williams, Benjamin F., to Benwilco, Inc. Rotary engine. 4,170,213, Cl. 123-222.000.

Williams, David W., to Westinghouse Electric Corp. High speed CMOS sense circuit for semiconductor memories. 4,170,741, Cl. 307-355.000.

Williams, Kenneth A. Method and apparatus for converting thermal energy to mechanical energy. 4,170,116, Cl. 62-116.000.

Williamson, Roger C.; and Kobylinski, Thaddeus P., to Gulf Research and Development Company. Synthesis of ethylene glycol from

carbon monoxide and hydrogen using a ruthenium complex catalyst and a pyridine base ligand. 4,170,605, Cl. 260-449.00L.

Williamson, Roger C.; and Kobylinski, Thaddeus P., to Gulf Research and Development Company. Synthesis of ethylene glycol from carbon monoxide and hydrogen using an iridium complex catalyst and a pyridine base ligand. 4,170,606, Cl. 260-449.00L.

Wilson, Hugh R. Bowstring release mechanism. 4,170,216, Cl. 124-35.00A.

Wilson, James R.: *See—*
Crawford, Wheeler C.; and Wilson, James R., 4,170,484, Cl. 106-281.00N.

Windish, Willis E.; and Winzeler, James E., to Caterpillar Tractor Co. Transmission arrangement. 4,170,152, Cl. 74-606.00R.

Winter, John M., Jr.: *See—*
Pond, Robert B., Sr.; Winter, John M., Jr.; and Tibbetts, Bruce S., 4,170,257, Cl. 164-87.000.

Winzeler, James E.: *See—*
Windish, Willis E.; and Winzeler, James E., 4,170,152, Cl. 74-606.00R.

Wirbisky, Theodore J.: *See—*
Edwards, Donald W.; Kinard, Richard D.; Wirbisky, Theodore J.; and Angelucci, Richard J., 4,170,287, Cl. 198-657.000.

Wismer, Marco: *See—*
Bosso, Joseph F.; and Wismer, Marco, 4,170,579, Cl. 260-29.2TN.

Wissner, Allan, to American Cyanamid Company. 1-Hydroxymethyl-1-oxo-prostane derivatives of the E_2 series. 4,170,597, Cl. 260-340.90P.

Withycombe, Donald A.; Mookherjee, Braja D.; Vock, Manfred H.; and Vinals, Joaquin F., to International Flavors & Fragrances Inc. Isobutyl substituted heterocyclic compounds and uses for augmenting or enhancing the organoleptic properties of smoking compositions. 4,170,236, Cl. 131-2.000.

Witte, Paul A.: *See—*
Pappas, Michael; Witte, Paul A.; and Severud, Christopher N., Jr., 4,170,189, Cl. 116-106.000.

Wittren, Richard A.: *See—*
Kittle, Carl E.; and Wittren, Richard A., 4,170,113, Cl. 60-427.000.

Wolf, Theo: *See—*
Gunschmann, Peter; Rossmann, Heinrich; Wolf, Theo; and Gause, Dieter, 4,170,787, Cl. 360-95.000.

Wolfe, Robert W., to Clark Equipment Company. Double oscillating motion-single linear motion cam. 4,170,148, Cl. 74-337.500.

Wommelsdorf, Fritz, to Maschinenfabrik Rissen GmbH. Method and apparatus for making rolled containers. 4,170,172, Cl. 93-94.0FC.

Woo, Lecon, to Du Pont de Nemours, E. I., and Company. Method and apparatus for measuring the loss modulus of materials. 4,170,141, Cl. 73-579.000.

Wood, Edward H., to Jim Walter Corporation. Weather strip and balance assemblies for windows. 4,170,090, Cl. 49-176.000.

Wood, Eric. Offshore platforms. 4,170,431, Cl. 405-202.000.

Woodbury, David R.: *See—*
Zagata, Robert J.; Shaw, Wilfrid G.; and Woodbury, David R., 4,170,570, Cl. 252-437.000.

Woodmansee, Wayne E.: *See—*
Kennedy, James C.; and Woodmansee, Wayne E., 4,170,145, Cl. 73-620.000.

Woodroffe, Jaime A.: *See—*
Mack, Michael E.; and Woodroffe, Jaime A., 4,170,762, Cl. 331-94.50D.

Woodruff, Royston F., to E M I Limited. Energy regulator. 4,170,734, Cl. 250-402.000.

Worthington, Robert W. Combination AC and DC electrical starting motor for engines. 4,170,211, Cl. 123-179.00B.

Wortmann, Joachim; Schonrogge, Burkhard; Cremer, Joseph; and Dany, Franz-Josef, to Hoechst Aktiengesellschaft. Process for making self-extinguishing laminates. 4,170,508, Cl. 156-308.000.

Wright, Harold A., to Arco Polymers, Inc. Bead size distribution in the suspension polymerization of vinyl aromatic monomers in the presence of glutamic acid. 4,170,699, Cl. 526-215.000.

Wright, Stanley J., to GTE Automatic Electric Laboratories Incorporated. Method and holding fixture for soldering lead frames to hybrid substrates. 4,170,326, Cl. 228-37.000.

Wuebker, Robert A.: *See—*
Beck, Harold L.; Wuebker, Robert A.; and Aure, Louis J., deceased, 4,170,373, Cl. 280-666.000.

WWG Industries, Inc.: *See—*
Norris, Alan H.; and Chambley, Phillip W., 4,170,103, Cl. 57-293.000.

Wyatt, Danny L.: *See—*
Case, Nelson S.; and Wyatt, Danny L., 4,170,478, Cl. 96-66.400.

Xerox Corporation: *See—*
Daughton, John W.; Gillett, Kenneth; Nelson, Frank; and Wilczek, Stephen P., 4,170,791, Cl. 364-900.000.

Yacono, Charles: *See—*
Atlani, Martial; Corso, Vincent; Wakselman, Claude; Loutaty, Roben; and Yacono, Charles, 4,170,547, Cl. 208-326.000.

Yamada, Shun-Ichi; Terashima, Shiro; Nagakura, Masahiko; and Nara, Munehiko, to Kowa Company, Ltd. Novel monoesters of cis-cyclopentenediol, process for preparation thereof, and process for preparation of lactones from the monoesters. 4,170,596, Cl. 260-326.470.

Yamagata, Hisao, to Citizen Watch Company Limited. Switch mechanism for wristwatch. 4,170,104, Cl. 58-23.00R.

Yamaguchi, Masaru: *See—*
Narita, Kiichi; Hara, Hiroshi; Taniguchi, Masayuki; Yamaguchi, Masaru; and Matumoto, Iwao, 4,170,139, Cl. 73-425.600.

Yamaguchi, Shunzo: *See—*
Mori, Kouichi; Igashira, Toshihiko; Yamaguchi, Shunzo; Kawai, Hisasi; and Morino, Seiji, 4,170,212, Cl. 123-211.000.

Yamamoto Electric Industrial Co., Ltd.: *See—*
Soeda, Katsuji, 4,170,749, Cl. 318-331.000.

Yamamoto, Hisataka: *See—*
Hirasawa, Youji; and Yamamoto, Hisataka, 4,170,671, Cl. 427-388.00C.

Yamanashi, Teruaki: *See—*
Itoh, Hiroyuki; Yamanashi, Teruaki; and Imai, Hirosuke, 4,170,583, Cl. 260-29.70H.

Yanik, Stephen J.: *See—*
Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., 4,170,545, Cl. 208-210.000.
Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., 4,170,546, Cl. 208-210.000.

Yano, Shuya: *See—*
Kaito, Hiroyuki; Ohtani, Takashi; Iwaoka, Shoji; Oguchi, Yukio; Yano, Shuya; and Ejima, Akio, 4,170,467, Cl. 75-49.000.

Yasuda, Shinji: *See—*
Hashimoto, Komei; Komatsubara, Masahiro; Yasuda, Shinji; Masumoto, Yutaka; and Satoh, Kazuhiko, 4,170,788, Cl. 360-129.000.

Yoder, Paul R., Jr.; Schlesinger, Eugene R.; and Crane, Robert, Jr., to Perkin-Elmer Corporation, The. Passive error compensating device for optical alignment. 4,170,401, Cl. 350-173.000.

Yohe, Robert A.; and McIver, John F., to Bethlehem Steel Corporation. Apparatus for measuring pipe length. 4,170,067, Cl. 33-143.00L.

Yoneya, Kiyoo, to Yoshida Kogyo, K. K. Fish rearing enclosure with a readily closable mouth. 4,170,196, Cl. 119-3.000.

York Luggage Corporation: *See—*
Schwartzstein, Marvin, 4,170,282, Cl. 190-43.000.

Yoshida Kogyo, K. K.: *See—*
Yoneya, Kiyoo, 4,170,196, Cl. 119-3.000.

Yoshida Kogyo K.K.: *See—*
Akashi, Shunji, 4,170,617, Cl. 264-23.000.

Yoshida, Susumu; Ishigaki, Yoshio; Shinkai, Kinya; and Tsuchiya, Takao, to Sony Corporation. Video signal reproducing apparatus with electron beam scanning velocity modulation. 4,170,785, Cl. 358-242.000.

Yoshimi, Toshikazu: *See—*
Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, 4,170,742, Cl. 310-324.000.

Young, James W.; and Furniss, Malcolm M., to United States of America, Agriculture. Controlled release formulations of Douglas-fir beetle anti-aggregative pheromone, 3-methyl-2-cyclohexen-1-one. 4,170,631, Cl. 424-19.000.

Young, Rodney C.: *See—*
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., 4,170,652, Cl. 424-263.000.

Zagata, Robert J.; Shaw, Wilfrid G.; and Woodbury, David R., to Standard Oil Company (Ohio). Process for preparing oxidation catalysts. 4,170,570, Cl. 252-437.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,170,642, Cl. 424-180.000.

Zander, Eberhard: *See—*
Busch, Heinrich; and Zander, Eberhard, 4,170,752, Cl. 320-44.000.

Zeidler, Ulrich; and Scheuermann, Fanny, to Henkel Kommanditgesellschaft auf Aktien. Stable aqueous or aqueous-alcoholic solutions of fat-soluble perfume oils or drugs containing hydroxyalkyl ester- or N-(hydroxyalkyl) amide-ethoxylates. 4,170,655, Cl. 424-284.000.

Zelinski, Robert J. Shipping and display tray and package. 4,170,294, Cl. 206-45.330.

Zethraeus, Claude, to AGA-CTC Varmevaxlare AB. Method and apparatus for manufacturing a heat exchanger. 4,170,055, Cl. 29-157.30R.

Zeugner, Horst: *See—*
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Budden, Renke; and Bahlsen, Jacqueline, 4,170,649, Cl. 424-244.000.

Zgraggen, Martin A., to General Electric Company. Method for making and applying irradiation curable glass banding. 4,170,505, Cl. 156-162.000.

Zottl, Felicitas, heir: *See—*
Hegenberg, Peter, deceased; Hegenberg, Johanna M., heir; Hegenberg, Dagmar, heir; Hegenberg, Joachim, heir; Zottl, Felicitas, heir; Rossnagel, Sigrid, heir; Freyberger, Heidelore, heir; Sprenger, Hans-Ernst; Birkner, Helm.it; Gude, Armin; Menzel, Gerhard; and Rombusch, Konrad, 4,170,588, Cl. 260-45.80N.

Zucchi, Dario: *See—*
Cappellini, Mario; and Zucchi, Dario, 4,170,093, Cl. 52-741.000.

Zwicky, Paul; and Marthaler, Eduard, to Studer, Willi. Bearing arrangement for a record player tonearm. 4,170,361, Cl. 274-23.00A.

Zwicky, Paul; and Marthaler, Eduard, to Studer, Willi. Bearing arrangement for a record player tonearm. 4,170,362, Cl. 274-23.00A.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF OCTOBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Blood, William R., Jr., to Motorola, Inc. Digital single signal line full duplex method and apparatus. Re. 30,111, Cl. 178-58.00R.

Bouyoucos, John V.; Selsam, Roger L.; and Courtright, Dennis R., to Hydroacoustics Inc. Hydroacoustic apparatus and valving mechanisms for use therein. Re. 30,109, Cl. 91-276.000.

Courtright, Dennis R.: *See*—
Bouyoucos, John V.; Selsam, Roger L.; and Courtright, Dennis R., Re. 30,109, Cl. 91-276.000.

Huebsch, Donald L.; and Paulos, Louis B. Fail-safe safety cut-off valve for a fluid well. Re. 30,110, Cl. 166-65.00M.

Hydroacoustics Inc.: *See*—
Bouyoucos, John V.; Selsam, Roger L.; and Courtright, Dennis R., Re. 30,109, Cl. 91-276.000.

Motorola, Inc.: *See*—
Blood, William R., Jr., Re. 30,111, Cl. 178-58.00R.

Oliver, Wayne H. Bin panel construction. Re. 30,108, Cl. 52-584.000.

Paulos, Louis B.: *See*—
Huebsch, Donald L.; and Paulos, Louis B., Re. 30,110, Cl. 166-65.00M.

Selsam, Roger L.: *See*—
Bouyoucos, John V.; Selsam, Roger L.; and Courtright, Dennis R., Re. 30,109, Cl. 91-276.000.

LIST OF PLANT PATENTEES

Conard-Pyle Company: *See*—
Goujon, Claude, 4,463, Cl. 1.000.

Goujon, Claude, to Conard-Pyle Company. Rose understock—Fredica variety. 4,463, 10-9-79, Cl. 1.000.

LIST OF DESIGN PATENTEES

American Home Products Corp.: *See*—
Baxter, Hedwig, 253,126, Cl. D24-31.000.
Baxter, Hedwig, 253,127, Cl. D24-31.000.

AMF Incorporated: *See*—
Hahn, Daniel G., 253,102, Cl. D12-110.000.
Hahn, Daniel G., 253,103, Cl. D12-110.000.

Armstrong Cork Company: *See*—
Corrigan, James L., 253,080, Cl. D6-188.000.

Artcarved Class Rings, Inc.: *See*—
Glueckselig, Gabrielle, 253,093, Cl. D11-35.000.

Attanasio, Dominick B., to Howmedica, Inc. Container for injectable substance. 253,128, 10-9-79, Cl. D24-56.000.

B & B Italia S.p.A.: *See*—
Busnelli, Ambrogio, 253,078, Cl. D6-71.000.

Baxter, Hedwig, to American Home Products Corp. Necropsy board for small animals. 253,126, 10-9-79, Cl. D24-31.000.

Baxter, Hedwig, to American Home Products Corp. Necropsy board for small animals. 253,127, 10-9-79, Cl. D24-31.000.

Beatty, James A. Flower displaying ornament. 253,095, 10-9-79, Cl. D11-121.000.

Beihoffer, Randall A.: *See*—
Hinklin, Darrell W.; and Beihoffer, Randall A., 253,086, Cl. D8-8.000.

Berger, Milton, to Washington Forge, Inc. Cutlery holder. 253,084, 10-9-79, Cl. D7-74.000.

Boisjolie, Charles C.; and Oakleaf, Thomas D. Sports cart. 253,099, 10-9-79, Cl. D12-34.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Marloth, Herbert, 253,129, Cl. D24-62.000.

Bressler, Peter W., to Edmund Scientific Company. Telescope. 253,113, 10-9-79, Cl. D16-60.000.

Bretschger, Edward B., to Louis Marx & Co., Inc. Pinball game cabinet. 253,120, 10-9-79, Cl. D21-9.000.

Broadbent, Edward G. Floor bearer for use in a motor vehicle. 253,130, 10-9-79, Cl. D25-74.000.

Broadbent, Edward G. Vertical door end frame for a motor vehicle. 253,131, 10-9-79, Cl. D25-76.000.

Busnelli, Ambrogio, to B & B Italia S.p.A. Arm-chair. 253,078, 10-9-79, Cl. D6-71.000.

Clayborne, William J.: *See*—
Hauser, Hans; and Clayborne, William J., 253,111, Cl. D15-149.000.

Conforti, Frederick J., to Pittway Corporation. Housing for fire and smoke detector. 253,092, 10-9-79, Cl. D10-106.000.

Corrigan, James L., to Armstrong Cork Company. Display rack. 253,080, 10-9-79, Cl. D6-188.000.

Culbertson, Richard, to General Electric Company. Tape player or similar article. 253,107, 10-9-79, Cl. D14-6.000.

Dart Industries Inc.: *See*—
Fritz, Ann K., 253,091, Cl. D8-395.000.

DiBenedetto, Luigi, to TRW Inc. Printer. 253,134, 10-9-79, Cl. D18-13.000.

Drackett Company, The: *See*—
Jones, David A., 253,123, Cl. D23-3.000.

Driben, Beatrice G. Two-tailed dog sculpture. 253,096, 10-9-79, Cl. D11-158.000.

Durst AG. Fabrik Fototechnischer Apparate: *See*—
Pramstraller, Wilmuth, 253,112, Cl. D16-31.000.

Edmund Scientific Company: *See*—
Bressler, Peter W., 253,113, Cl. D16-60.000.

Fontana, Jeanette N. Combined child carrier and shoulder bag. 253,135, 10-9-79, Cl. D3-31.000.

Fritz, Ann K., to Dart Industries Inc. Combined clip and holder or the like. 253,091, 10-9-79, Cl. D8-395.000.

General Electric Company: *See*—
Culbertson, Richard, 253,107, Cl. D14-6.000.

George P. Johnson Co.: *See*—
Vallee, Robert G., 253,104, Cl. D12-157.000.

Glueckselig, Gabrielle, to Artcarved Class Rings, Inc. Ring. 253,093, 10-9-79, Cl. D11-35.000.

Gudell, Gary, to Jacoby-Bender, Inc. Jewelry clasp. 253,094, 10-9-79, Cl. D11-87.000.

Hackemann, William, to Hasbro Industries, Inc. Metric converter slide rule. 253,114, 10-9-79, Cl. D18-9.000.

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Holce, Thomas J.; and Huckins, Charles M. Housing for magnetic contact switch component. 253,106, 10-9-79, Cl. D13-32.000.

Howmedica, Inc.: *See*—
Attanasio, Dominick B., 253,128, Cl. D24-56.000.
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Holce, Thomas J.; and Huckins, Charles M., 253,106, Cl. D13-32.000.
J. B. Foote Foundry Co., The: *See*—
Hauser, Hans; and Clayborne, William J., 253,111, Cl. D15-149.000.
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Knight, Joseph L. Scribing rule guide. 253,117, 10-9-79, Cl. D19-35.000.
Lam, Tang Bing. Juice extractor. 253,083, 10-9-79, Cl. D7-49.000.
Lamont, William. Foldable document holder. 253,119, 10-9-79, Cl. D19-90.000.
Larson, Goran S. Stackable tote tray. 253,076, 10-9-79, Cl. D3-68.000.
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Levin, Paul. Canvas stretching pliers. 253,088, 10-9-79, Cl. D8-52.000.
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Bretschger, Edward B., 253,120, Cl. D21-9.000.
Maddock, Peter L.: *See*—
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Mainetti, Mario, to Mainetti S.p.A. Garment hanger. 253,081, 10-9-79, Cl. D6-255.000.
Mainetti S.p.A.: *See*—
Mainetti, Mario, 253,081, Cl. D6-255.000.
Marloth, Herbert, to Bosch-Siemens Hausgerate GmbH. Ultrasonic nebulizer. 253,129, 10-9-79, Cl. D24-62.000.
Martin, Herbert A., to Rolls Gerard Tile Company Limited. Tile. 253,132, 10-9-79, Cl. D25-92.000.
Mercer, Robert J. Scraper. 253,085, 10-9-79, Cl. D7-184.000.
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Hida, Hiroyuki, 253,121, Cl. D21-108.000.
Moncrief, J. D. Coffee filter screen. 253,082, 10-9-79, Cl. D7-47.000.
Morgan, Carl R. Combined log rack and carrier. 253,098, 10-9-79, Cl. D12-32.000.
Oakleaf, Thomas D.: *See*—
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Phelps, Edith M. Bird-like statuette or the like. 253,097, 10-9-79, Cl. D11-162.000.
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Conforti, Frederick J., 253,092, Cl. D10-106.000.
Pivar, Stuart. Three-wheeled motor vehicle. 253,101, 10-9-79, Cl. D12-85.000.
Pramstraller, Wilmuth, to Durst AG. Fabrik Fototechnischer Apparate. Photographic enlarging apparatus. 253,112, 10-9-79, Cl. D16-31.000.
Primault, Andre, to Societe Generale de Fonderie. Corner bathtub. 253,124, 10-9-79, Cl. D23-55.000.
Primault, Andre, to Societe Generale de Fonderie. Bathtub. 253,125, 10-9-79, Cl. D23-55.000.
Randolph, Richard D. Check or credit card verification terminal. 253,110, 10-9-79, Cl. D14-43.000.
Rapid Metal Developments Pty. Ltd.: *See*—
Sharley, Aubrey N., 253,090, Cl. D8-354.000.
Reiner, Kenneth, to Kayline Enterprises, Inc. Tool holding fixture. 253,089, 10-9-79, Cl. D8-71.000.
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Sansui Electric Co., Ltd.: *See*—
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Schroeder, Donald S., to Pemcor, Inc. Loudspeaker. 253,108, 10-9-79, Cl. D14-30.000.
Schuller, Frank C. Can opener. 253,087, 10-9-79, Cl. D8-18.000.
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Smoloff, Barbara R. Doll. 253,122, 10-9-79, Cl. D21-166.000.
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Toro Company, The: *See*—
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DiBenedetto, Luigi, 253,134, Cl. D18-13.000.
Tsuyuki, Akio, to Tomy Kogyo Co., Inc. Device for moving a writing instrument in a repetitive pattern. 253,116, 10-9-79, Cl. D19-35.000.
Vallee, Robert G., to George P. Johnson Co. Car top luggage container. 253,104, 10-9-79, Cl. D12-157.000.
Washington Forge, Inc.: *See*—
Berger, Milton, 253,084, Cl. D7-74.000.
West, Roger D. Combined paper clip and paper weight. 253,118, 10-9-79, Cl. D19-86.000.
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CLASSIFICATION OF PATENTS

ISSUED OCTOBER 9, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

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